PLH18AK
PLH24AK
PLH30AK
PLH36AK
PLH42AK

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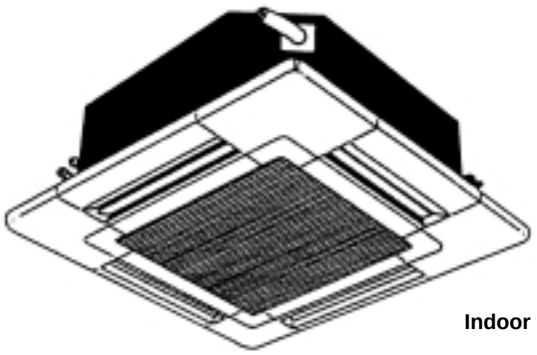
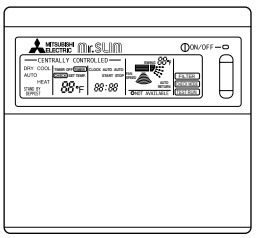
1 FEATURES



Indoor Unit



Microprocessor
Remote controller

Models	Cooling capacity / Heating capacity	SEER
PLH18AK	18,000 / 19,000 (25,500) Btu/h	10.5
PLH24AK	24,000 / 26,000 (32,500) Btu/h	10.3
PLH30AK	30,000 / 33,000 (41,200) Btu/h	10.4
PLH36AK	35,400 / 38,000 (47,600) Btu/h	10.0
PLH42AK	42,000 / 44,300 (53,900) Btu/h	10.7

1. SPACE-SAVING CENTRALLY LOCATED CEILING RECESSED INSTALLATION

2. 4-WAY AIR FLOW SYSTEM

This series allows you to select from 2, 3, and 4 way air flow directions according to your requirement. As a result, you get superb flexibility in choosing a configuration that gives you maximum cooling/heating efficiency in a neat and unobstructive installation.

3. STABLE COOLING EVEN AT OUTDOOR TEMPERATURES AS LOW AS 0°F MAKES YEAR-ROUND AIR-CONDITIONING POSSIBLE

The microprocessor automatically adjusts fan speed in accordance with outdoor temperature to maintain the coolant at an even condensing temperature. The result is smooth, efficient cooling even when temperatures outdoors drop as low as 0°F. This makes the unit ideal for a wide range of specialized cooling needs, such as rooms with many office machines or computers and areas subject to strong sunlight.

4. ADVANCED MICROPROCESSOR CONTROL

(1) Easy to use Microprocessor (remote controller)

1) Ultra-Thin Remote Controller

The streamlined, wide controller is designed to blend with any kind of interior and the adoption of a sophisticated microprocessor allows you to carry out a wide range of operations easily.

2) Attractive Liquid Crystal Display (LCD)

Units operation mode, set temperature, room temperature, timer setting, fan speed, and air flow direction are displayed on the remote controller with the easily understood visual Liquid Crystal Display (LCD).

3) Convenient 24-Hour ON-OFF Timer

The timer allows Mr.SLIM to be switched on or off automatically at the time is shown on the LCD.

4) Self-Diagnostic Feature Indicates Faults Instantly

In the rare case when a problem occurs, the unit stops operating and the set temperature indicator changes to the self-diagnostic indicator, indicating the location of the fault.

If the check switch is pressed twice, the unit stops operating and the check mode is initiated. The cause of the most recent problem stored in the memory is displayed on the LCD. This is extremely useful for maintenance purposes.

5) Useful Memory Feature for Storing Instructions

The previous set value is memorized so that constant temperature control can be obtained. This is convenient when, for example, a power failure occurs.

(2) Non-polar Two-Wire Remote Controller Cables

The non-polar, two-wire type remote controller cable is slim, installation is simple and trouble-free. Remote controller wire can be extended up to 550 yards.

(3) Automatic Cooling/Heating Changeover Operation

An automatic cooling and heating changeover operation system is provided to ensure easy control and year-round air conditioning.

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperature. In addition, the use of outdoor unit fan speed controller enables cooling operation at outdoor temperature as low as 0°F.

5. DRAIN PUMP FOR EASY PIPE CONNECTION (DRAIN LIFT-UP MECHANISM)

This mechanism, with its capacity to raise drain water 33-7/16 inch above the ceiling line, is convenient for removing water and avoiding piping contact with beams, etc.

6. FRESH AIR INTAKE AND BRANCH DUCTING ARE AVAILABLE (on-site work)

7. REDI-CHARGED REFRIGERANT SYSTEM

The industry is first redi-charge refrigerant system.

There is no need to adjust the amount of refrigerant to match the piping length on-site unless lines exceed 100feet.

You will see a major reduction in installation time and labor costs.

8. HIGH RELIABILITY AND EASY SERVICING.

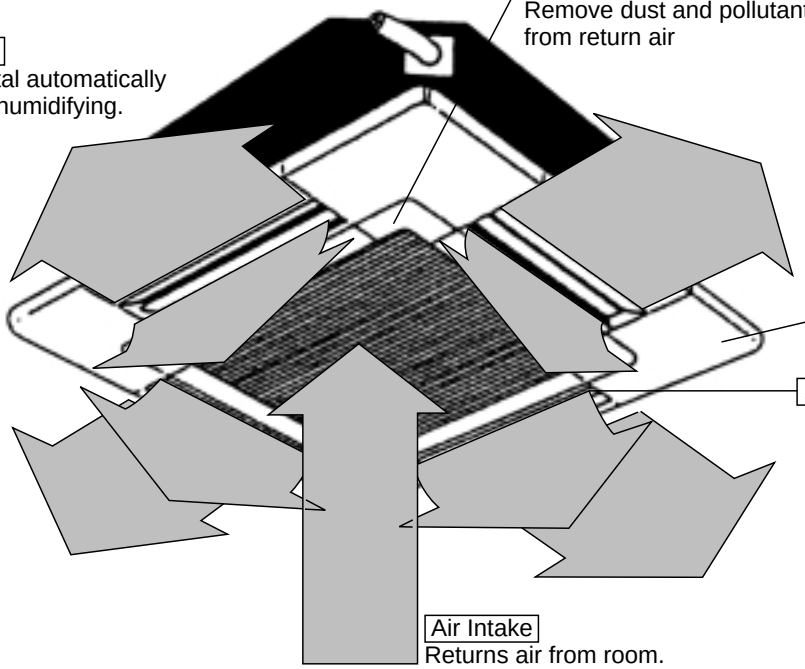
In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism (cooling), an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

9. NITROGEN GAS IS CHARGED TO INDOOR UNIT.

Indoor unit and refrigerant pipes are charged with nitrogen gas (N_2) instead of (R22) before shipment from the factory.

2 PART NAMES AND FUNCTIONS

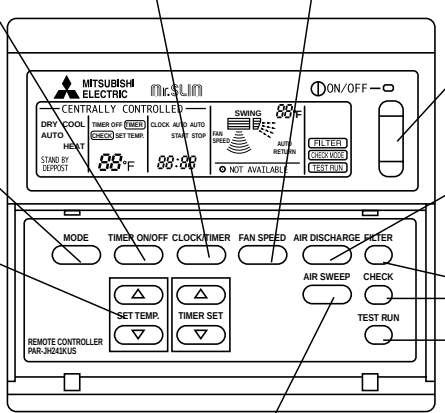
● Indoor (Main) Unit


Filter
Remove dust and pollutants from return air
Horizontal Air Outlet
Sets airflow horizontal automatically during cooling or dehumidifying.
Grille
Auto Air Swing Vane
Disperses airflow up and down and adjusts the angle of airflow direction.
Air Intake
Returns air from room.

● Remote controller

On the controls are set, the same operation mode can be repeated by simply pressing the ON/OFF button.

● Operation buttons



TIMER ON/OFF button

This switches between continuous operation and the timer operation.

CLOCK/TIMER button

This sets or switches the current time,start time and stop time.

FAN SPEED button

This sets the ventilation fan speed.

OPERATION MODE button

Press this button to switch the cooling,electronic dry (Dehumidify),automatic and heating modes.

ON/OFF button

This switches between the operation and stop modes each time it is press. The lamp on this button lights during operation.

AIR DISCHARGE button

This adjusts the vertical angle of the vane.

SET TEMPERATURE button

This sets the room temperature.
The temperature setting can be performed in 2°F units.

Setting range :

Cooling	65°F to 87°F
Heating	61°F to 83°F

FILTER button

This resets the filter service indication display.

AIR SWEEP button

This switches the horizontal louver motion ON and OFF.

(Not available for this model.)

CHECK-TEST RUN button

Press twice this button to perform an inspection check or test operation.
Do not use it for normal operation.

● Display

CENTRALLY CONTROLLED display

This indicates when the unit is controlled by optional features such as central control type remote controller.

CLOCK display

The current time , start time and stop time can be displayed in ten second intervals by pressing the time switch button. The start time or stop time is always displayed during the timer operation.

In this display example on the bottom left, a condition where all display lamps light is shown for explanation purposes although this differs from actual operation.

AIR DISCHARGE display

This displays the air direction.

(TIMER) display

This indicates when the continuous operation and time operation modes are set.
It also display the time for the timer operation at the same time as when it is set.

FAN SPEED display

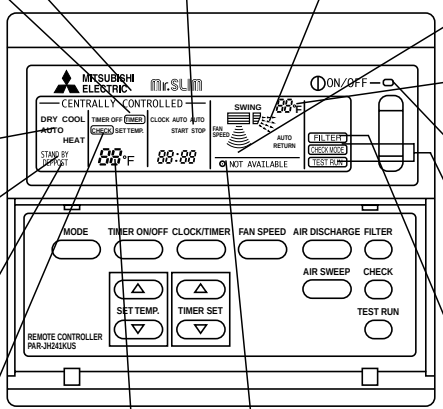
The selected fan speed is displayed.

OPERATION MODE display

This indicates the operation mode.

88°F display

The temperature of the return air is displayed during operation. The display range is 47° to 97°F. The display flashes 47°F when the actual temperature is less than 47° and flashes 97°F when the actual temperature is greater than 97°F.



STANDBY display

This indicates when the standby mode is set from the time the heat operation starts until the heating air is discharged.

Operation lamp

This lamp lights during operation, goes off when the unit stops and flashes when a malfunction occurs.

DEFROST display

This indicates when the defrost operation is performed.

(CHECK MODE) (TEST RUN) display

This display lights in the check mode or when a test operation is performed.

(CHECK) display

This indicates when a malfunction has occurred in the unit which should be checked.

88°F display

This displays the selected setting temperature.

⊙display

This lamp lights when electricity is supplied to the unit.

(FILTER) display

This lamp lights when the filter needs to be cleaned.

Caution

- Only the ⊙ display lights when the unit is stopped and power supplied to the unit.
- When power is turned ON for the first time the (CENTRAL CTRL) display appears to go on momentarily but this is not a malfunction.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button,OPERATION MODE button and SET TEMP button do not operate.
- "NOT AVAILABLE" is displayed when the AIR SWEEP button are pressed.
  (AIR SWEEP function is not provided for PLH series.)

3 SPECIFICATIONS

MODELS : PLH18/24/30/36/42AK

Item \ Model				PLH18AK	PLH24AK	PLH30AK	PLH36AK	PLH42AK
Capacity	Cooling	*1	Btu/h	18,000	24,000	30,000	35,400	42,000
	Heating	*1, *3	Btu/h	19,000(24,500/25,500)	26,000(31,500/32,500)	33,000(39,500/41,200)	38,000(45,900/47,600)	44,300(52,200/53,900)
	Heating	*2, *3	Btu/h	11,000(16,500/17,500)	16,500(22,000/23,000)	18,500(25,000/26,700)	23,000(30,900/32,600)	26,800(34,700/36,400)
Moisture removal			Pints/h	5.3	7.0	9.1	10.9	12.3
Power Consumption	Cooling	*1	kW	1.75	2.57	3.17	3.63	3.98
	Heating	*1, *3	kW	1.59(3.19/3.49)	2.51(4.11/4.41)	3.04(4.94/5.44)	3.45(5.75/6.25)	3.82(6.12/6.62)
	Heating	*2, *3	kW	1.32(2.92/3.22)	2.15(3.75/4.05)	2.55(4.45/4.95)	2.93(5.23/5.73)	3.24(5.54/6.04)
EER		*1		10.3	9.3	9.5	9.8	10.6
SEER				10.5	10.3	10.4	10.0	10.7
HSPF				7.2	7.0	6.9	7.1	7.0
COP		*1		3.5	3.0	3.2	3.2	3.4
		*2		2.4	2.2	2.1	2.3	2.4
INDOOR UNIT MODELS				**PLH18AK**	**PLH24AK**	**PLH30AK**	**PLH36AK**	**PLH42AK**
External finish				Galvanized sheets with gray heat insulation				
Power supply			V,phase,Hz	208/230,1,60				
Max.fuse size (time delay)			A	20		25		
Min.ampacity			A	15		17		
Fan motor			F.L.A.	0.7	1.2		1.4	
Booster heater			A(kW)	7.7/8.3(1.6/1.9)		9.1/10.4(1.9/2.4)	11.1/12.2(2.3/2.8)	
Airflow Hi-Lo	Dry		CFM	710-530	990-710	1060-780		
	Wet		CFM	670-490	950-670	1020-740		
Sound level Hi-Lo			dB	37-31	41-33	43-35	45-37	
Unit drain pipe O.D.			in.	1-1/4				
Dimensions	W		in.	33-1/16				
	D		in.	33-1/16				
	H		in.	10-3/16	11-3/4			
Weight			lb	57	71		75	
INDOOR GRILLE External finish				Munsell 0.7Y 8.59/0.97				
Dimensions	W		in.	37-3/8				
	D		in.	37-3/8				
	H		in.	1-3/16				
Weight			lb	11				
OUTDOOR UNIT MODELS				PUH18EK	PUH24EK	PUH30EK$_1$	PUH36EK$_1$	PUH42EK7

NOTES : *1.Rating conditions (cooling)-indoor : 80˚FDB,67˚FWB outdoor : 95˚FDB,75˚FWB.
(heating)-indoor : 70˚FDB,60˚FWB outdoor : 47˚FDB,43˚FWB.
*2.Rating conditions (heating)-indoor : 70˚FDB,60˚FWB outdoor : 17˚FDB,15˚FWB.
*3.Heating capacity and Heating power consumption in ( ) includes heater operation at 208/230V.

Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	95˚FDB,71˚FWB	115˚FDB
	Minimum	67˚FDB,57˚FWB	0˚FDB*
Heating	Maximum	80˚FDB,67˚FWB	75˚FDB,65˚FWB
	Minimum	70˚FDB,60˚FWB	17˚FDB,15˚FWB

* In case of the wind baffle is installed.
(In case of the wind baffle is not installed, the minimum temperature will be 23˚FDB.)

4 DATA

MODELS : PLH18/24/30/36/42AK

1. PERFORMANCE DATA

1) COOLING CAPACITY

Models	Indoor air			Outdoor intake air DB temperature(˚F)																	
	Airflow (CFM) / B.F		IWB (˚F)	65			75			85			95			105			115		
				TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PLH18AK	670 / 0.14		71	21.4	14.4	1.45	20.9	14.1	1.53	20.3	13.6	1.64	19.4	13.0	1.80	18.4	12.4	1.96	17.6	11.8	2.10
			67	20.1	16.3	1.42	19.5	15.8	1.49	18.9	15.3	1.60	18.0	14.6	1.75	17.1	13.8	1.90	16.3	13.2	2.02
			63	18.8	17.7	1.39	18.2	17.2	1.46	17.6	16.6	1.57	16.8	15.8	1.70	15.9	15.0	1.84	15.1	14.2	1.96
	DB 75°F (50%RH)		62.5	18.6	15.9	1.39	18.1	15.4	1.46	17.4	14.9	1.59	16.6	14.1	1.70	15.7	13.4	1.84	14.9	12.7	1.95
	DB 72°F (50%RH)		60	17.9	15.2	1.37	17.3	14.7	1.44	16.7	14.2	1.54	15.9	13.5	1.67	15.1	12.8	1.81	14.3	12.1	1.92
	DB 70°F (50%RH)		59	17.6	14.9	1.36	17.0	14.4	1.43	16.4	13.9	1.53	15.6	13.2	1.66	14.8	12.5	1.79	14.0	11.8	1.90
PLH24AK	950 / 0.09		71	28.5	19.2	2.13	27.9	18.8	2.24	27.0	18.2	2.41	25.8	17.4	2.64	24.6	16.5	2.88	23.5	15.8	3.08
			67	26.8	21.7	2.09	26.0	21.1	2.19	25.2	20.4	2.35	24.0	19.4	2.57	22.8	18.5	2.79	21.7	17.6	2.97
			63	25.1	23.6	2.05	24.3	22.9	2.14	23.5	22.1	2.30	22.4	21.1	2.50	21.2	19.9	2.71	20.1	19.0	2.88
	DB 75°F (50%RH)		62.5	24.8	21.1	2.04	24.1	20.5	2.14	23.2	19.8	2.29	22.1	18.9	2.49	21.0	17.9	2.70	19.9	17.0	2.87
	DB 72°F (50%RH)		60	23.8	20.3	2.02	23.1	19.6	2.11	22.3	19.0	2.26	21.2	18.0	2.46	20.1	17.1	2.65	19.1	16.2	2.82
	DB 70°F (50%RH)		59	23.4	19.8	2.00	22.7	19.2	2.10	21.9	18.5	2.24	20.8	17.6	2.44	19.7	16.6	2.63	18.7	15.8	2.79
PLH30AK	1020 / 0.14		71	35.7	22.6	2.63	34.9	22.1	2.76	33.8	21.4	2.97	32.3	20.4	3.26	30.7	19.4	3.55	29.3	18.5	3.81
			67	33.4	25.8	2.58	32.6	25.1	2.70	31.5	24.2	2.90	30.0	23.1	3.17	28.5	21.9	3.44	27.1	20.9	3.66
			63	31.3	28.2	2.53	30.4	27.4	2.64	29.3	26.5	2.84	27.9	25.2	3.09	26.5	23.9	3.34	25.2	22.7	3.55
	DB 75°F (50%RH)		62.5	31.0	25.2	2.52	30.1	24.4	2.64	29.1	23.6	2.83	27.7	22.5	3.08	26.2	21.3	3.33	24.9	20.2	3.54
	DB 72°F (50%RH)		60	29.8	24.1	2.49	28.9	23.4	2.60	27.9	22.6	2.79	26.5	21.5	3.03	25.1	20.3	3.27	23.8	19.3	3.48
	DB 70°F (50%RH)		59	29.3	23.6	2.47	28.4	22.9	2.59	27.4	22.0	2.77	26.0	21.0	3.01	24.6	19.8	3.25	23.3	18.8	3.44
PLH36AK	1020 / 0.06		71	42.1	25.3	3.02	41.2	24.8	3.16	39.9	24.0	3.41	38.1	22.9	3.73	36.2	21.8	4.07	34.6	20.8	4.36
			67	39.5	29.2	2.95	38.4	28.4	3.09	37.1	27.5	3.33	35.4	26.2	3.63	33.6	24.9	3.94	32.0	23.7	4.20
			63	37.0	32.2	2.89	35.9	31.3	3.03	34.6	30.2	3.25	33.0	28.8	3.54	31.2	27.2	3.82	29.7	25.9	4.07
	DB 75°F (50%RH)		62.5	36.6	28.6	2.88	35.5	27.8	3.02	34.3	26.8	3.24	32.7	25.5	3.52	30.9	24.2	3.81	29.4	23.0	4.05
	DB 72°F (50%RH)		60	35.2	27.4	2.85	34.1	26.6	2.98	32.9	25.7	3.19	31.3	24.4	3.47	29.6	23.1	3.75	28.1	21.9	3.98
	DB 70°F (50%RH)		59	34.6	26.8	2.83	33.5	26.0	2.96	32.3	25.0	3.17	30.7	23.8	3.44	29.0	22.5	3.72	27.5	21.4	3.94
PLH42AK	1020 / 0.06		71	50.0	27.6	3.31	48.9	27.0	3.47	47.3	26.1	3.73	45.2	24.9	4.09	43.0	23.7	4.46	41.1	22.7	4.78
			67	46.8	32.3	3.24	45.6	31.4	3.39	44.0	30.4	3.65	42.0	29.0	3.98	39.9	27.5	4.32	38.0	26.2	4.60
			63	43.8	36.0	3.17	42.6	35.0	3.32	41.1	33.8	3.56	39.1	32.2	3.88	37.1	30.5	4.19	35.2	29.0	4.46
	DB 75°F (50%RH)		62.5	43.4	31.8	3.16	42.1	30.9	3.31	40.7	29.8	3.55	38.7	28.4	3.86	36.7	26.9	4.18	34.9	25.5	4.44
	DB 72°F (50%RH)		60	41.7	30.5	3.12	40.4	29.5	3.27	39.0	28.5	3.50	37.1	27.1	3.80	35.1	25.6	4.11	33.3	24.3	4.36
	DB 70°F (50%RH)		59	41.0	29.8	3.10	39.7	28.8	3.25	38.3	27.8	3.48	36.4	26.4	3.78	34.4	25.0	4.07	32.7	23.7	4.32

Notes 1. B.F. : Bypass Factor, IWB : Intake air wet-bulb temperature
TC : Total Capacity (x10^3 Btu/h), SHC : Sensible Heat Capacity (x10^3 Btu/h)
TPC : Total Power Consumption (kW)
2. SHC is based on 80˚FDB of indoor intake air temperature.
3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PLH18AK	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PLH24AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH30AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH36AK	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PLH42AK	1.0	0.975	0.955	0.935	0.918	0.900	0.884	0.869	0.855	0.840

2) HEATING CAPACITY

Models	Indoor air		Outdoor intake air WB temperature(˚F)												Auxiliary heater (208V/230V)	
	Airflow (CFM)	IDB (˚F)	15		25		35		45		55		65			
			CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC
PLH18AK	710	75	12.5	1.23	14.4	1.36	16.8	1.53	19.1	1.68	22.0	1.87	24.7	2.04	5.5	1.6
		70	12.8	1.19	14.7	1.32	17.2	1.48	19.5	1.62	22.4	1.80	25.0	1.96		
		65	13.1	1.15	15.0	1.27	17.6	1.42	19.9	1.56	22.9	1.73	25.5	1.88	6.5	1.9
PLH24AK	990	75	17.1	1.94	19.7	2.15	23.0	2.42	26.1	2.66	30.1	2.95	33.7	3.21	5.5	1.6
		70	17.5	1.88	20.1	2.08	23.5	2.33	26.6	2.56	30.7	2.84	34.2	3.09		
		65	17.9	1.81	20.6	2.00	24.1	2.24	27.2	2.45	31.3	2.73	34.9	2.97	6.5	1.9
PLH30AK	1060	75	21.8	2.36	25.0	2.16	29.2	2.93	33.1	3.22	38.2	3.58	42.8	3.89	6.5	1.9
		70	22.2	2.28	25.5	2.52	29.9	2.82	33.8	3.10	38.9	3.44	43.5	3.74		
		65	22.8	2.19	26.1	2.42	30.5	2.71	34.5	2.97	39.7	3.30	44.3	3.59	8.2	2.4
PLH36AK	1060	75	25.0	2.67	28.7	2.96	33.7	3.33	38.1	3.65	44.0	4.06	49.3	4.42	7.8	2.3
		70	25.6	2.58	29.4	2.86	34.4	3.20	38.9	3.51	44.8	3.90	50.0	4.25		
		65	26.2	2.49	30.1	2.75	35.2	3.08	39.8	3.37	45.7	3.75	51.0	4.08	9.6	2.8
PLH42AK	1060	75	29.2	2.96	33.5	3.28	39.2	3.68	44.5	4.04	51.3	4.49	57.5	4.89	7.8	2.3
		70	29.9	2.86	34.3	3.16	40.1	3.55	45.4	3.89	52.2	4.32	58.3	4.70		
		65	30.6	2.75	35.1	3.04	41.0	3.41	46.3	3.74	53.3	4.15	59.5	4.52	9.6	2.8

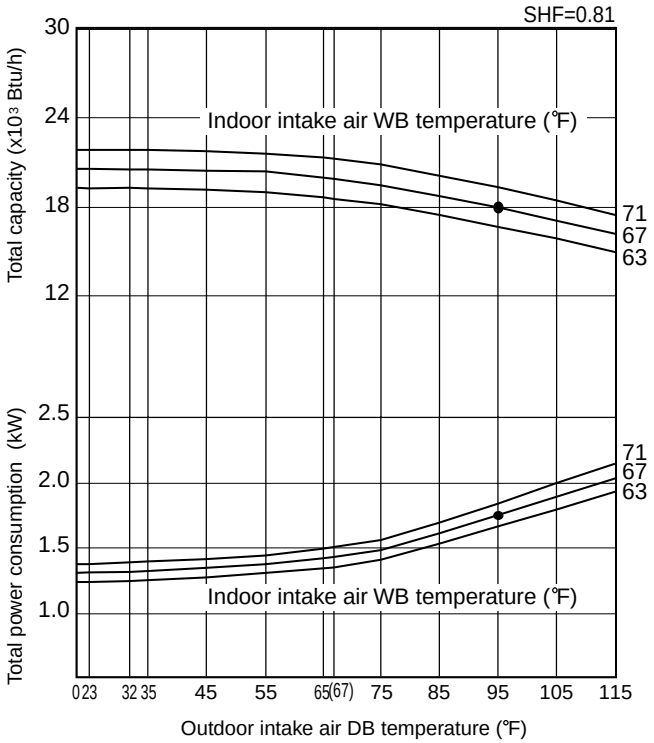
Notes 1. IDB : Intake air dry-bulb temperature
CA : Capacity (x10^3 Btu/h), PC : Power Consumption (kW)
2. When booster heater is "on", total capacity and total power consumption should be added the figures described in booster heater column.
•Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.
•Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.
3. Heating capacity correction factors.

Models	Refrigerant piping length (one way)		
	Less than 100ft	100~130ft	130~164ft
PLH18AK	1.00	0.995	0.990
PLH24AK	1.00	0.995	0.990
PLH30AK	1.00	0.995	0.990
PLH36AK	1.00	0.995	0.990
PLH42AK	1.00	0.995	0.990

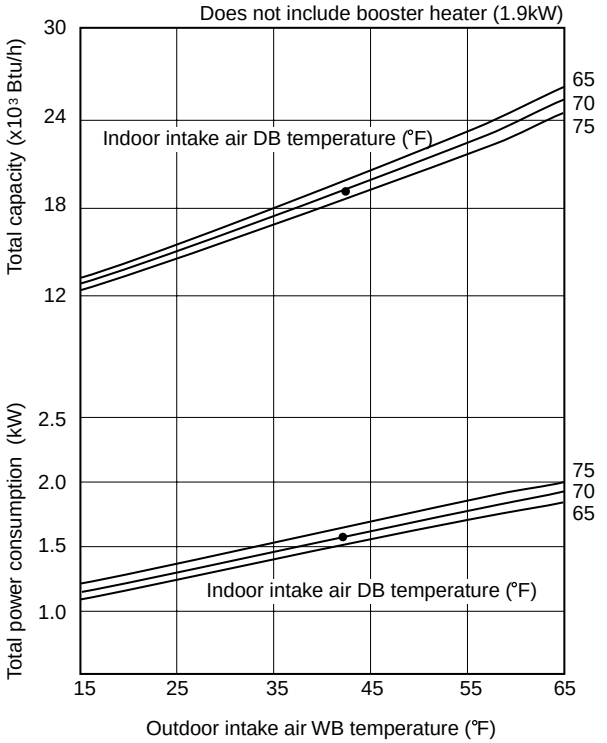
2. PERFORMANCE CURVE

NOTES : A point on the curve shows the reference point.

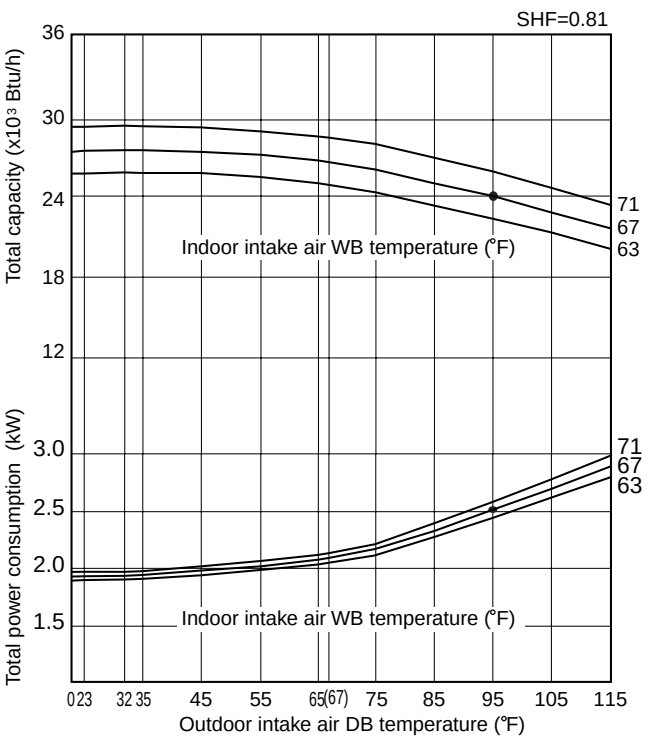
PLH18AK COOLING CAPACITY



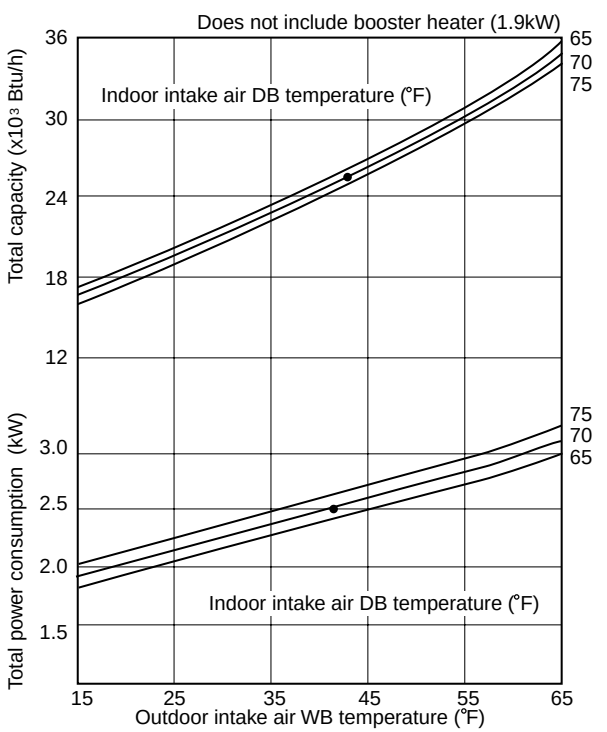
PLH18AK HEATING CAPACITY



PLH24AK COOLING CAPACITY

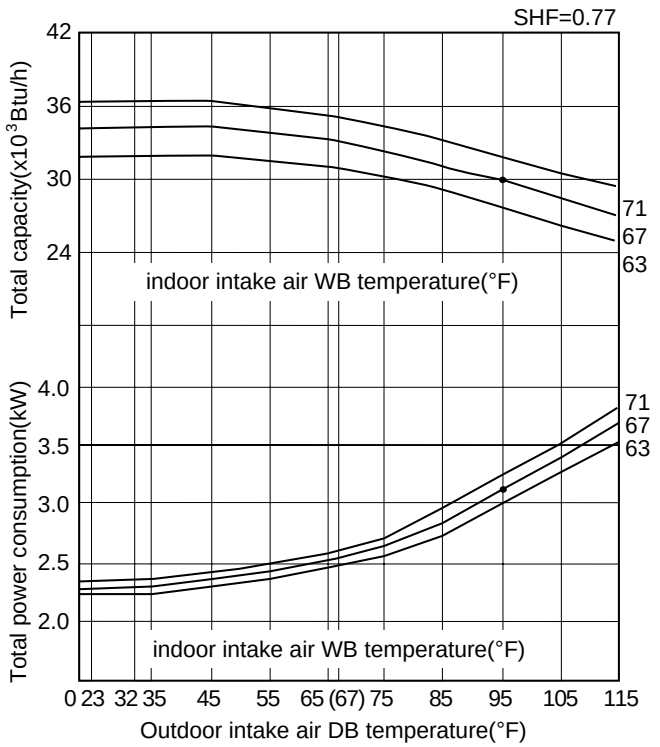


PLH24AK HEATING CAPACITY

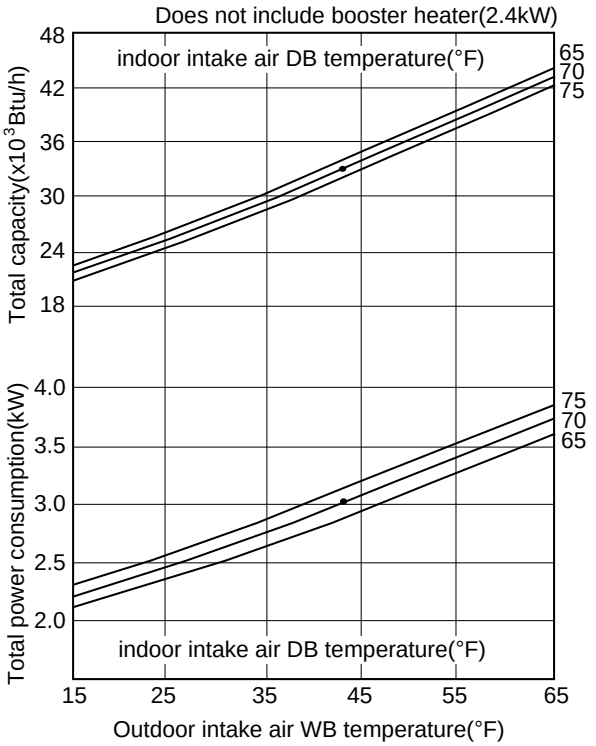


NOTES : A point on the curve shows the reference point.

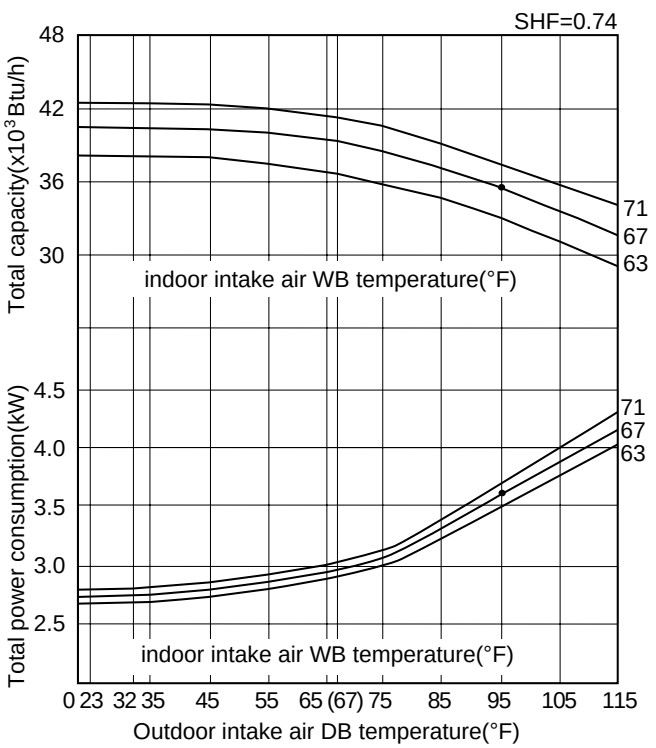
PLH30AK COOLING CAPACITY



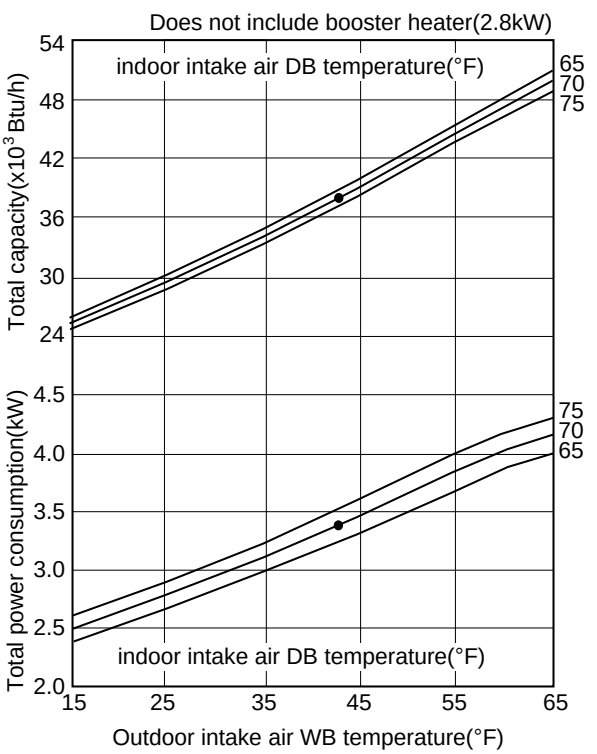
PLH30AK HEATING CAPACITY



PLH36AK COOLING CAPACITY

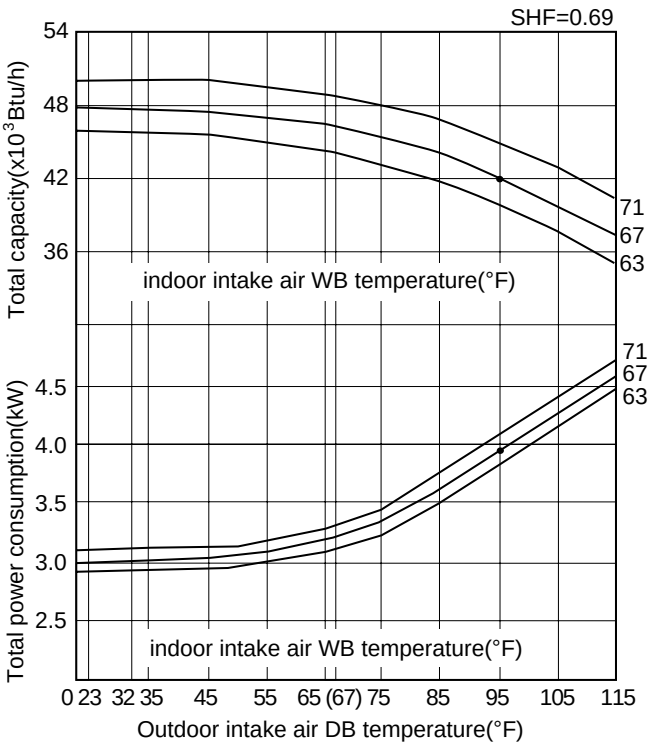


PLH36AK HEATING CAPACITY

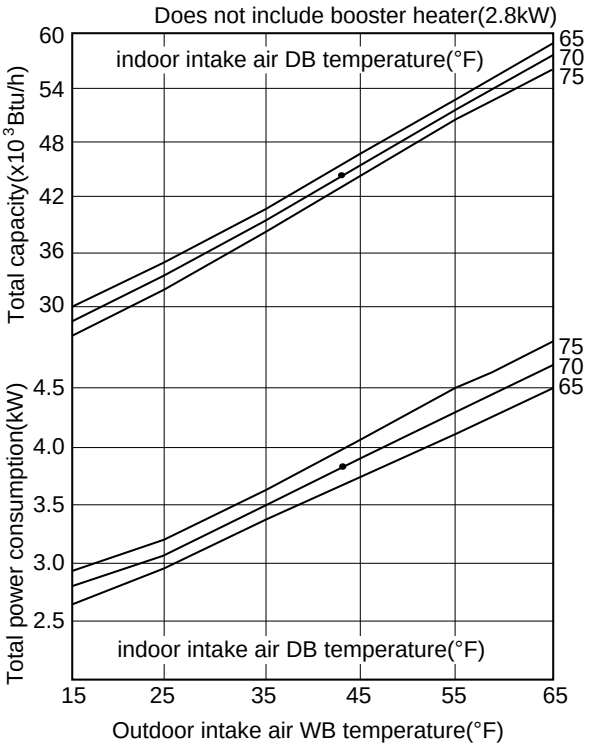


NOTES : A point on the curve shows the reference point.

PLH42AK COOLING CAPACITY



PLH42AK HEATING CAPACITY

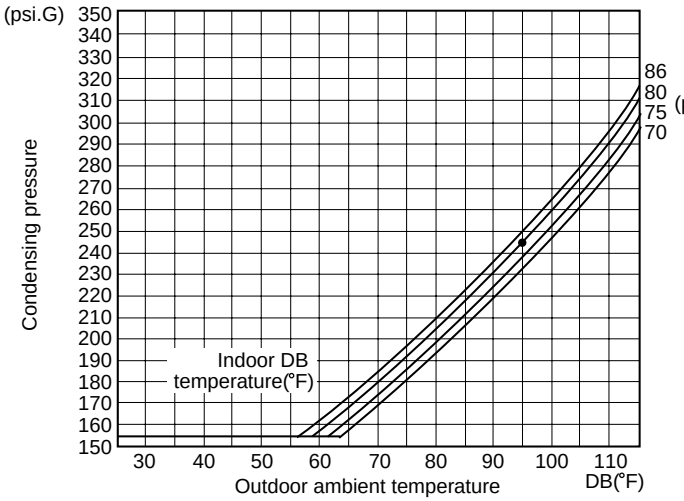


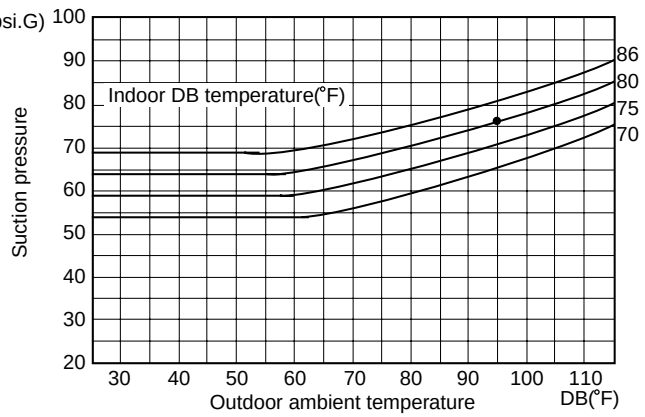
3. CONDENSING PRESSURE AND SUCTION PRESSURE

Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<PLH18AK>

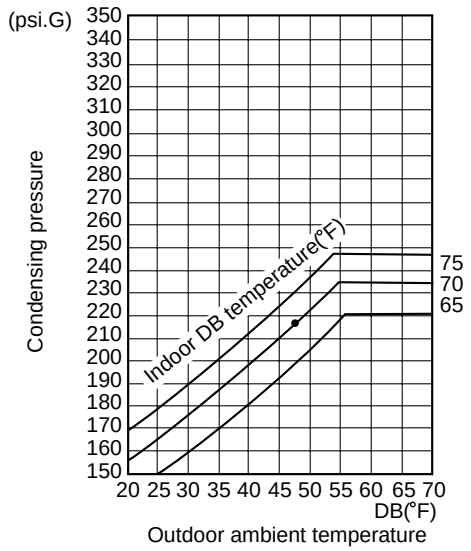
COOLING MODE

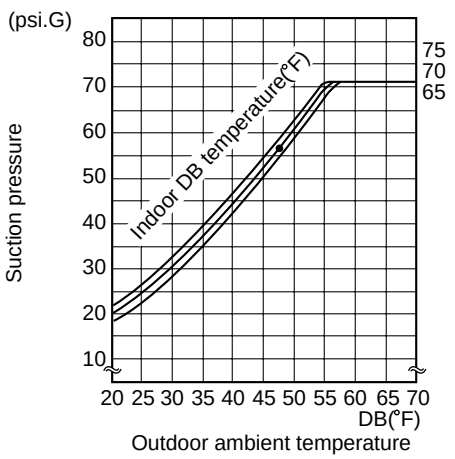




Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

HEATING MODE

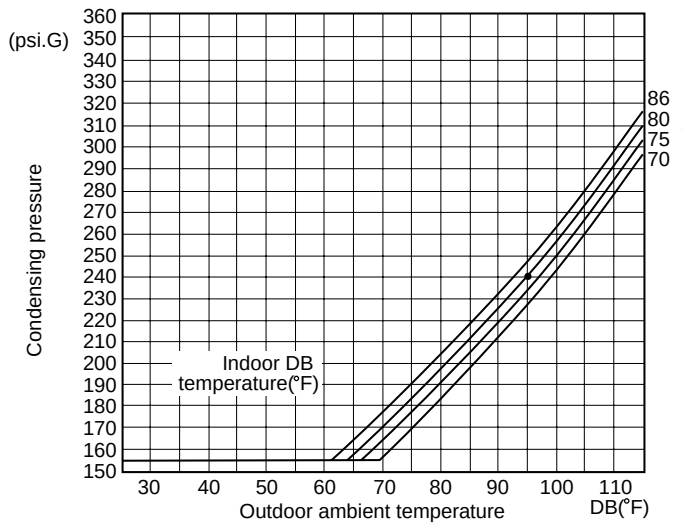


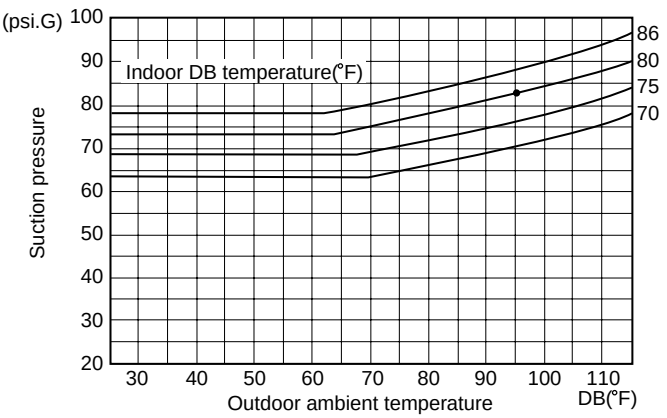


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<PLH24AK>

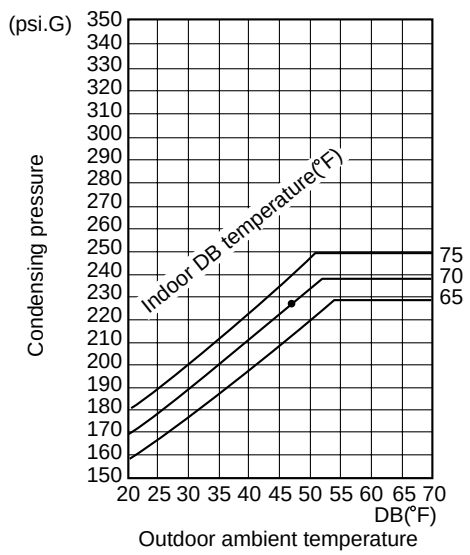
COOLING MODE

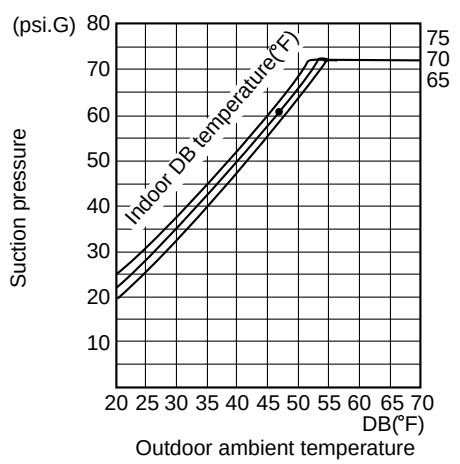




Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

HEATING MODE

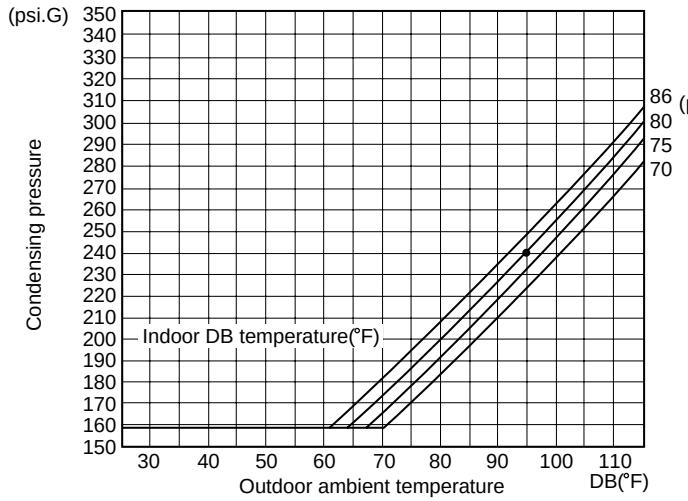


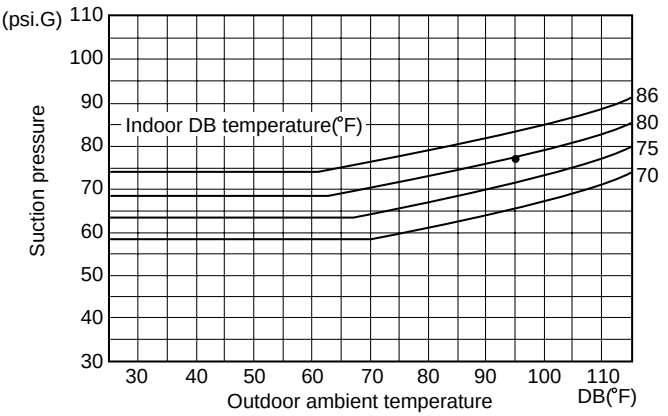


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<PLH30AK>

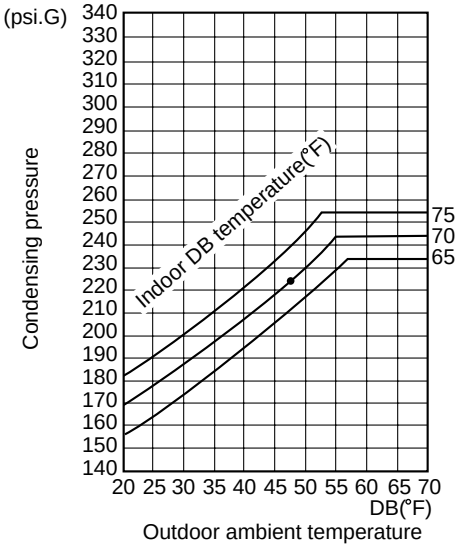
COOLING MODE

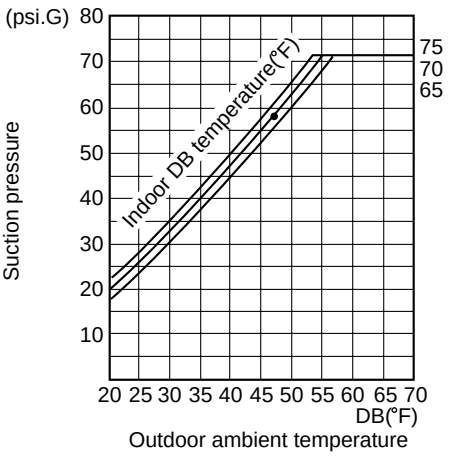




Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

HEATING MODE

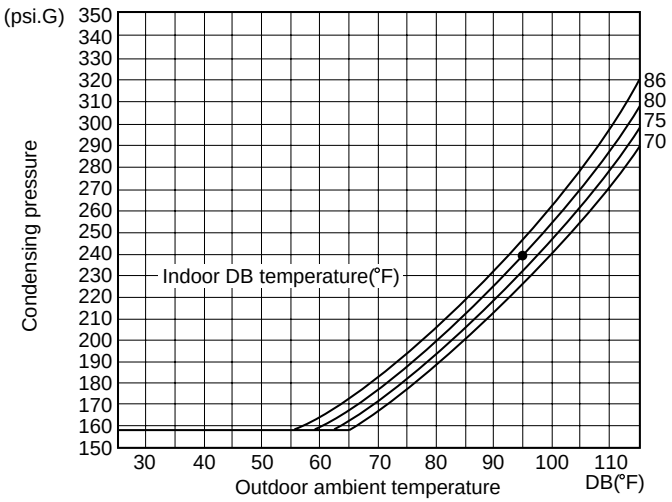


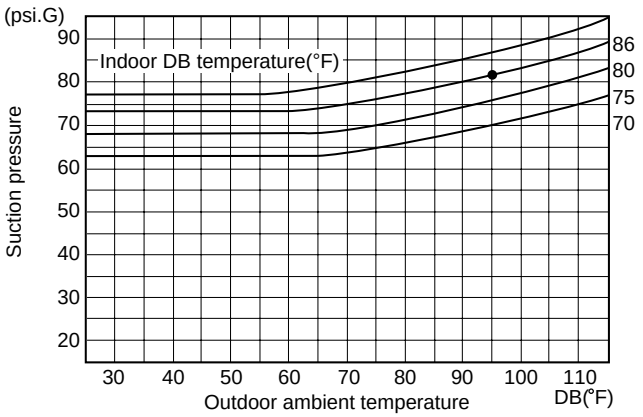


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<PLH36AK >

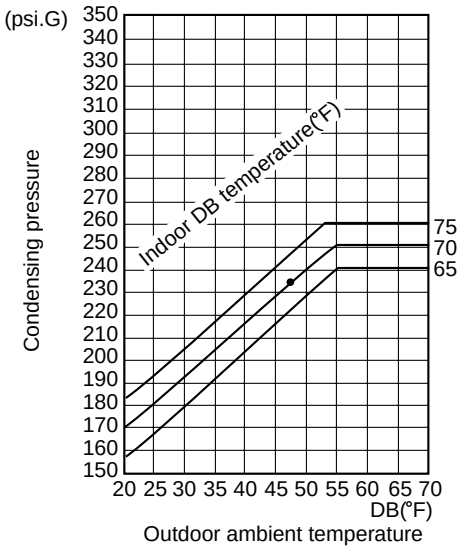
COOLING MODE

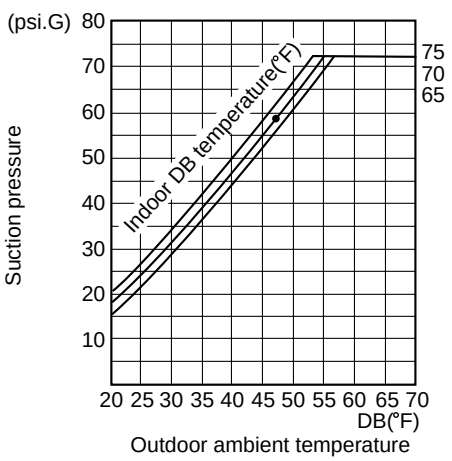




Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

HEATING MODE

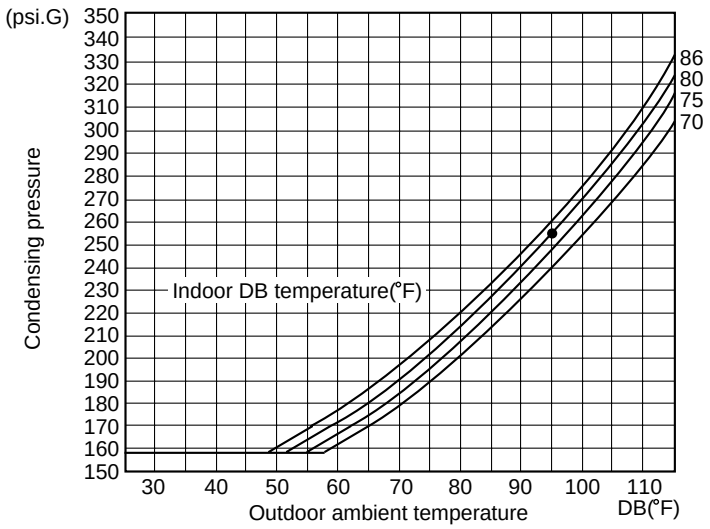


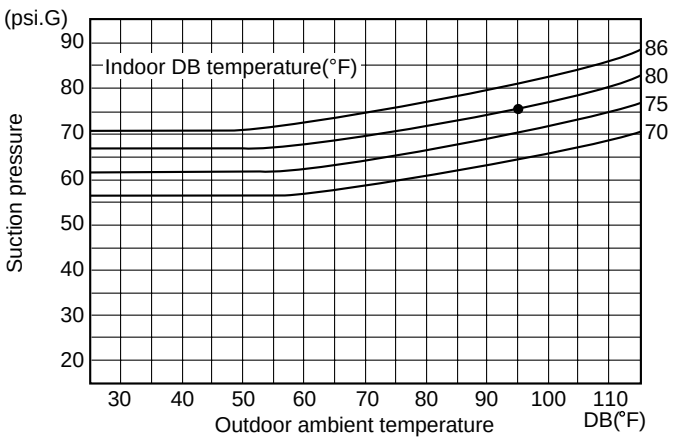


Data is based on the condition of indoor humidity 50%.
Air flow should be set at HI.
A point on the curve shows the reference point.

<PLH42AK >

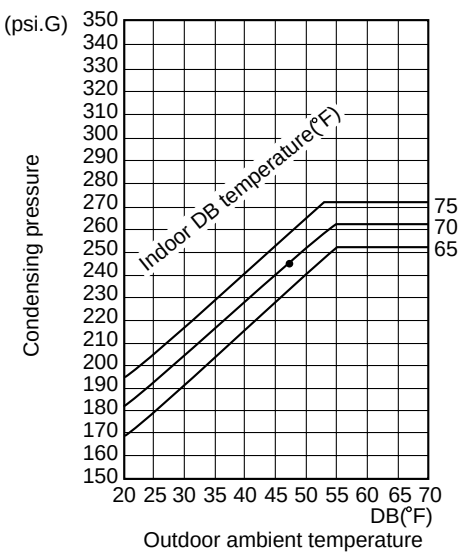
COOLING MODE

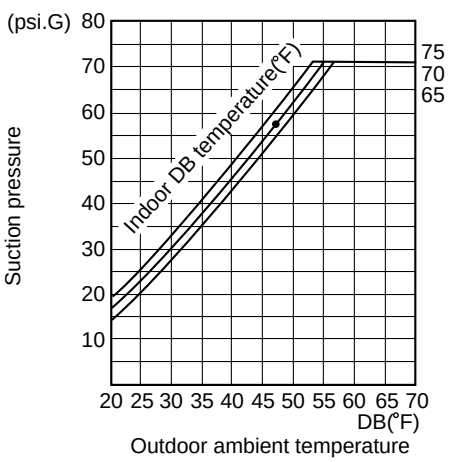




Data is based on the condition of outdoor humidity 75%.
A point on the curve shows the reference point.

HEATING MODE





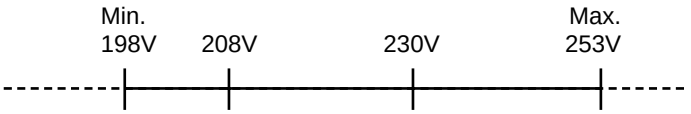
4. STANDARD OPERATION DATA

Models				PLH18AK		PLH24AK		PLH30AK		PLH36AK		PLH42AK	
Item			Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating
Electrical circuit	Voltage		V	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230
	Frequency		Hz	60		60		60		60		60	
	Total input		kW	1.75	1.59	2.57	2.51	3.17	3.04	3.63	3.45	3.98	3.82
	Indoor fan current		A	0.7	0.7	1.2	1.2	1.2	1.2	1.4	1.4	1.4	1.4
	Booster heater current		A	—	7.7/8.3	—	7.7/8.3	—	9.1/10.4	—	11.1/12.2	—	11.1/12.2
	Outdoor fan current		A	0.75	0.75	0.65+0.65	0.65+0.65	0.75+0.75	0.75+0.75	0.75+0.75	0.75+0.75	0.8+0.8	0.8+0.8
	Comp. current		A	7.5/7.0	6.5/6.3	9.9/9.1	9.5/8.8	12.8/12.1	12.2/11.6	14.5/13.4	13.6/12.8	16.5/15.6	16.1/14.9
Refrigerant circuit	Condensing pressure		psi·G	246	218	240	228	239	223	240	233	257	242
	Suction pressure		psi·G	76	57	83	62	77	58	81	59	76	57
	Discharge temperature		˚F	192	150	170	155	162	155	166	163	164	153
	Condensing temperature		˚F	116	107	114	112	114	109	114	112	119	115
	Suction temperature		˚F	70	34	53	36	49	34	51	35	46	32
	Comp.shell bottom temperature		˚F	189	145	156	135	152	142	155	147	110	76
	Ref. pipe length		ft	25		25		25		25		25	
	Refrigerant charge		—	5 lbs 8 oz		9 lbs 15 oz		10 lbs 2 oz		10 lbs 9 oz		11 lbs 0 oz	
Indoor side	Intake air temperature	DB	˚F	80	70	80	70	80	70	80	70	80	70
		WB	˚F	67	60	67	60	67	60	67	60	67	60
	Discharge air temperature	DB	˚F	60	96	59	96	59	101	57	106	54	112
		WB	˚F	59	—	58	—	58	—	56	—	54	—
	Fan speed		r.p.m.	530		640		690		790		790	
	Airflow (High)		CFM	710		990		1,060		1,060		1,060	
Outdoor side	Intake air temperature	DB	˚F	95	47	95	47	95	47	95	47	95	47
		WB	˚F	—	43	—	43	—	43	—	43	—	43
	Fan speed upper/lower		r.p.m.	790		750/750		760/760		760/760		840/840	
	Airflow		CFM	1,590		3,170		3,350		3,350		3,530	
Capacity			Btu/h	18,000	19,000	24,000	26,000	30,000	33,000	35,400	38,000	42,000	44,300
SHF			—	0.81	—	0.81	—	0.77	—	0.74	—	0.69	—

5. OPERATING RANGE

1) POWER SUPPLY

1 Phase 60Hz 208/230V
Guaranteed voltage range



2) OPERATION

Function	Air intake temperature / Condition	Indoor		Outdoor	
		DB(˚F)	WB(˚F)	DB(˚F)	WB(˚F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	0	—
	Maximum humidity	80	75	80	75
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	67	75	65
	Minimum temperature	70	60	17	15

6. OUTLET AIR SPEED AND COVERAGE RANGE

Model	Airflow (CFM)	Air speed (ft/sec)	Coverage range(ft)
PLH18AK	710	13.1	19
PLH24AK	990	16.1	24
PLH30AK	1,060	17.1	26
PLH36AK	1,060	21.7	29
PLH42AK	1,060	21.7	29

The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High notch position. The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

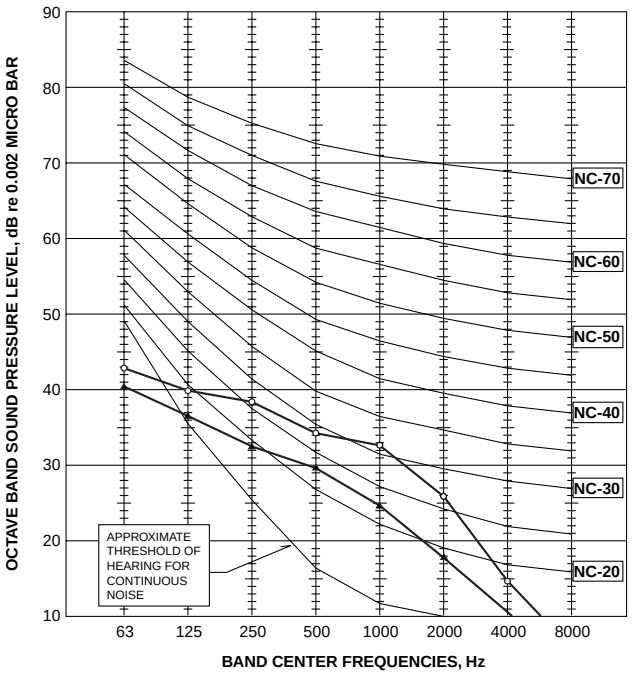
7. ADDITIONAL REFRIGERANT CHARGE (R22(oz))

Model	Outdoor unit precharged (up to 100ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PLH18AK	5 lbs 8 oz	0	0	0	0	0	0	2	4	—	—
PLH24AK	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PLH30AK	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20
PLH36AK	10 lbs 9 oz	0	0	0	0	0	0	5	10	16	20
PLH42AK	12 lbs 9 oz	0	0	0	0	0	0	5	10	16	20

7. NOISE CRITERION CURVES

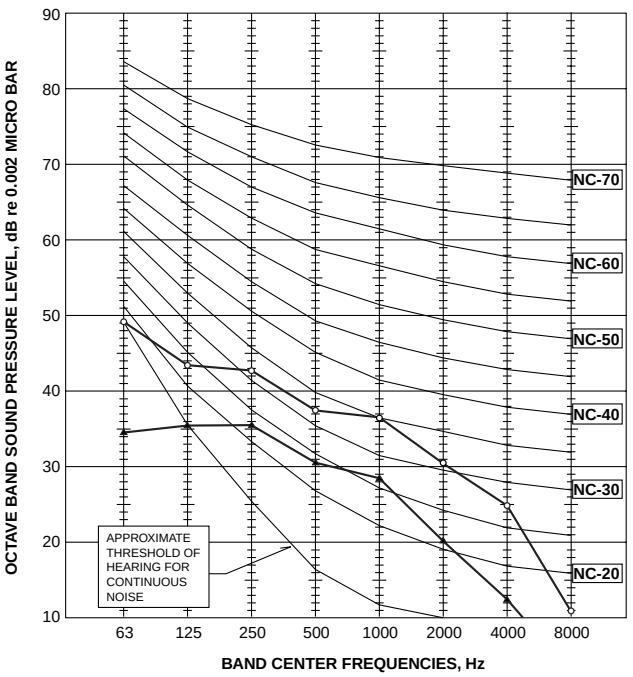
PLH18AK

NOTCH	SPL(dB)	LINE
Hi	37	○——○
Lo	31	▲——▲



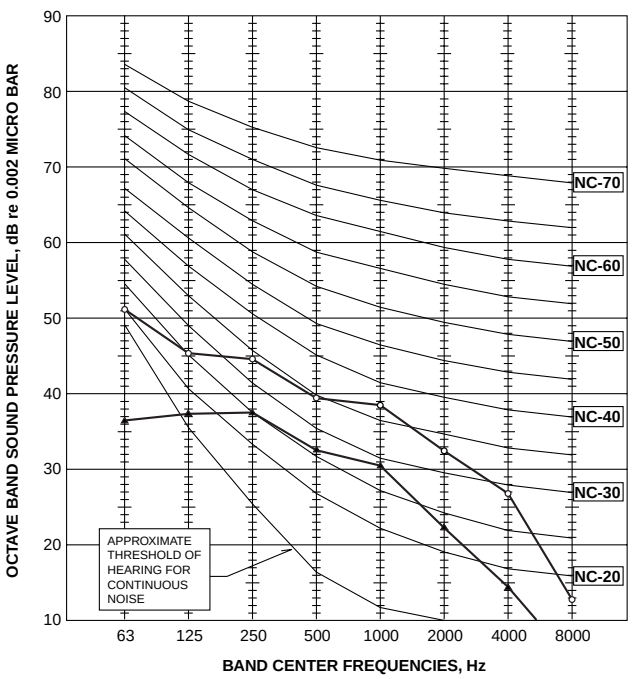
PLH24AK

NOTCH	SPL(dB)	LINE
Hi	41	○——○
Lo	33	▲——▲



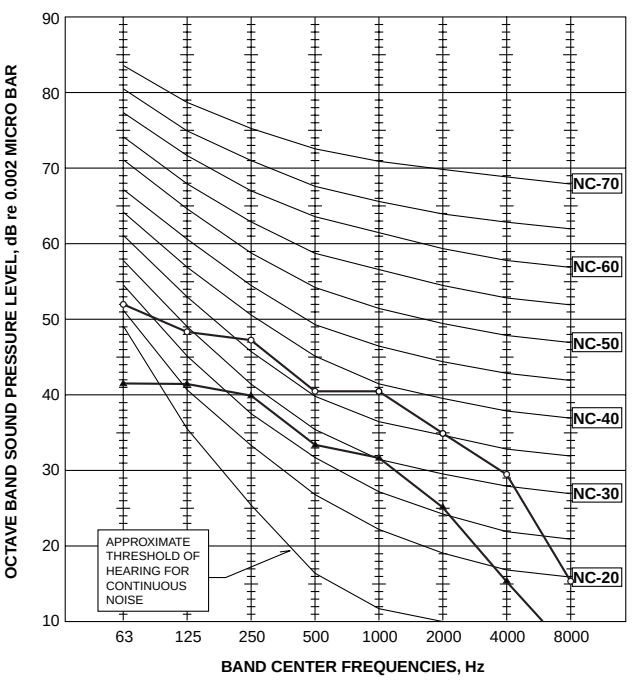
PLH30AK

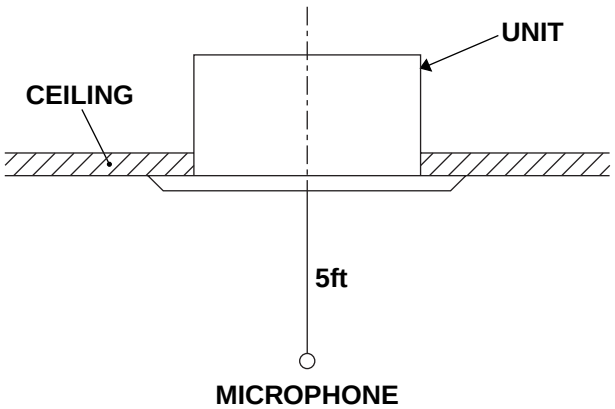
NOTCH	SPL(dB)	LINE
Hi	43	○——○
Lo	35	▲——▲



PLH36,42AK

NOTCH	SPL(dB)	LINE
Hi	45	○——○
Lo	37	▲——▲





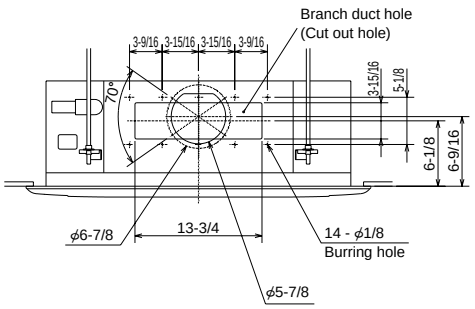
Ambient temperature 80˚F

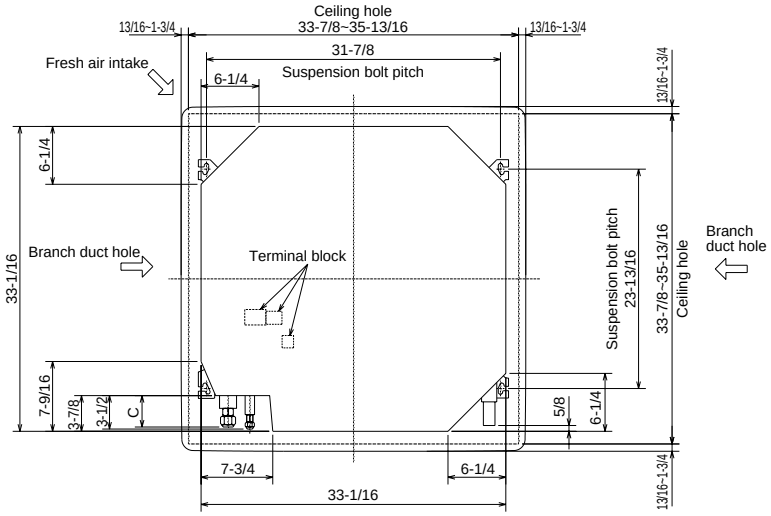
Test conditions are based on JIS Z8731

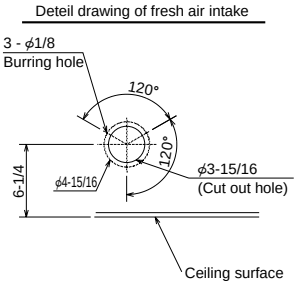
5 OUTLINES AND DIMENSIONS

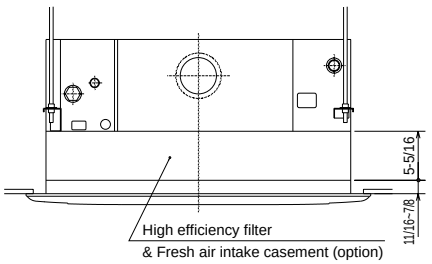
1. INDOOR UNIT PLH18AK , PLH24AK , PLH30AK , PLH36AK , PLH42AK

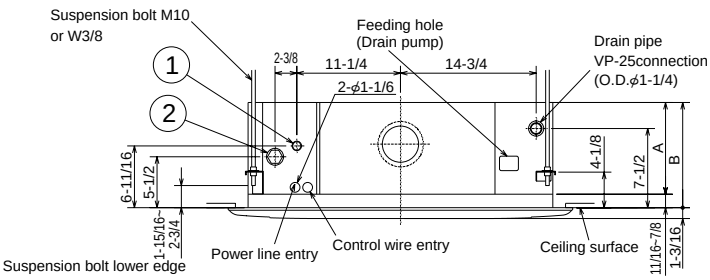
Unit : inch

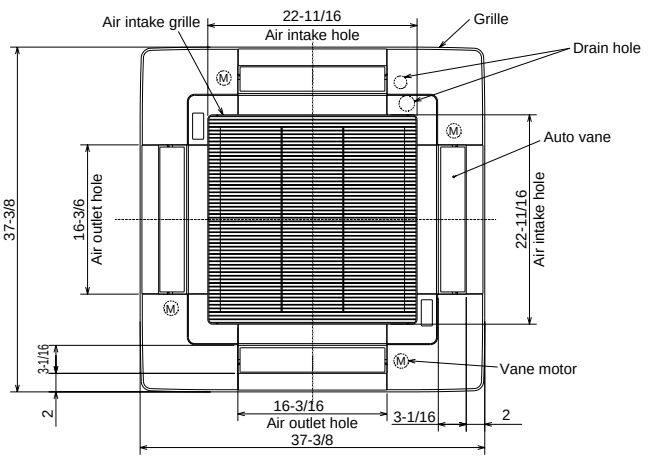








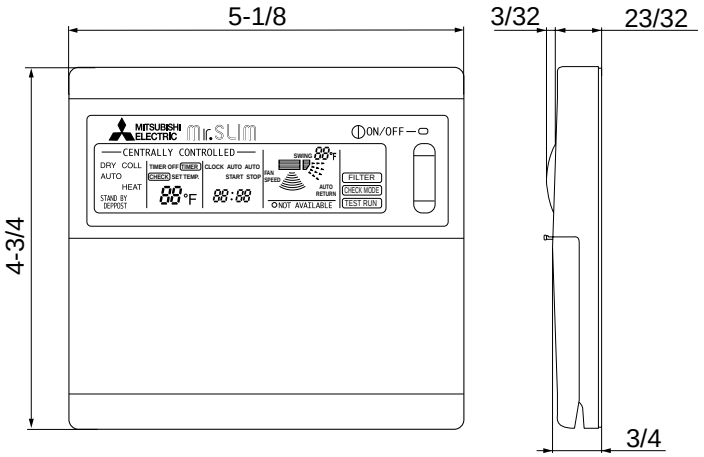




Models	①	②	A	B	C
PLH18AK	Refrigerant pipe flared connection 3/8F	Refrigerant pipe flared connection 5/8F	9-1/2	10-3/16	3-1/8
PLH24AK			11-1/16	11-3/4	
PLH30AK PLH36AK PLH42AK	Refrigerant pipe flared connection 1/2F	Refrigerant pipe flared connection 3/4F [42AK:7/8F]			3-5/16

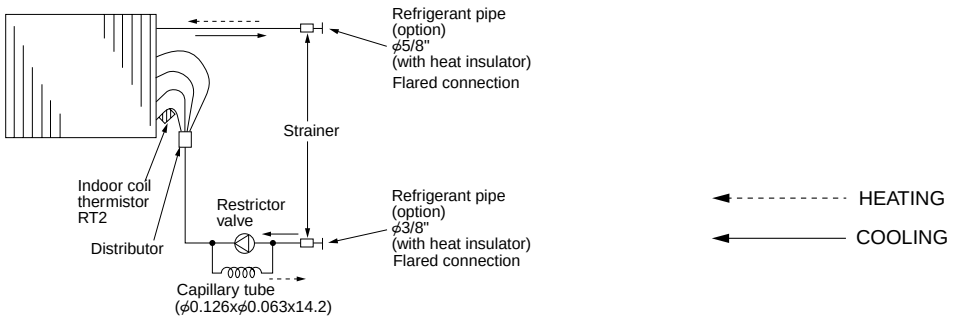
2.Remote controller

Unit : inch

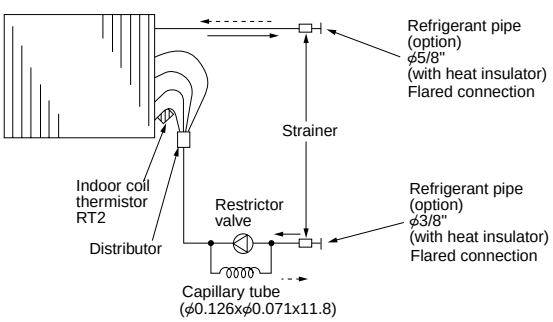


6 REFRIGERANT SYSTEM DIAGRAM

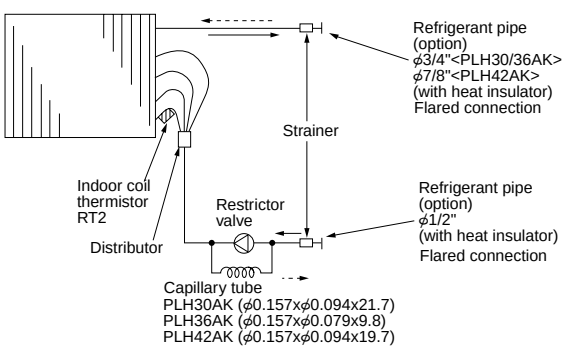
PLH18AK



PLH24AK

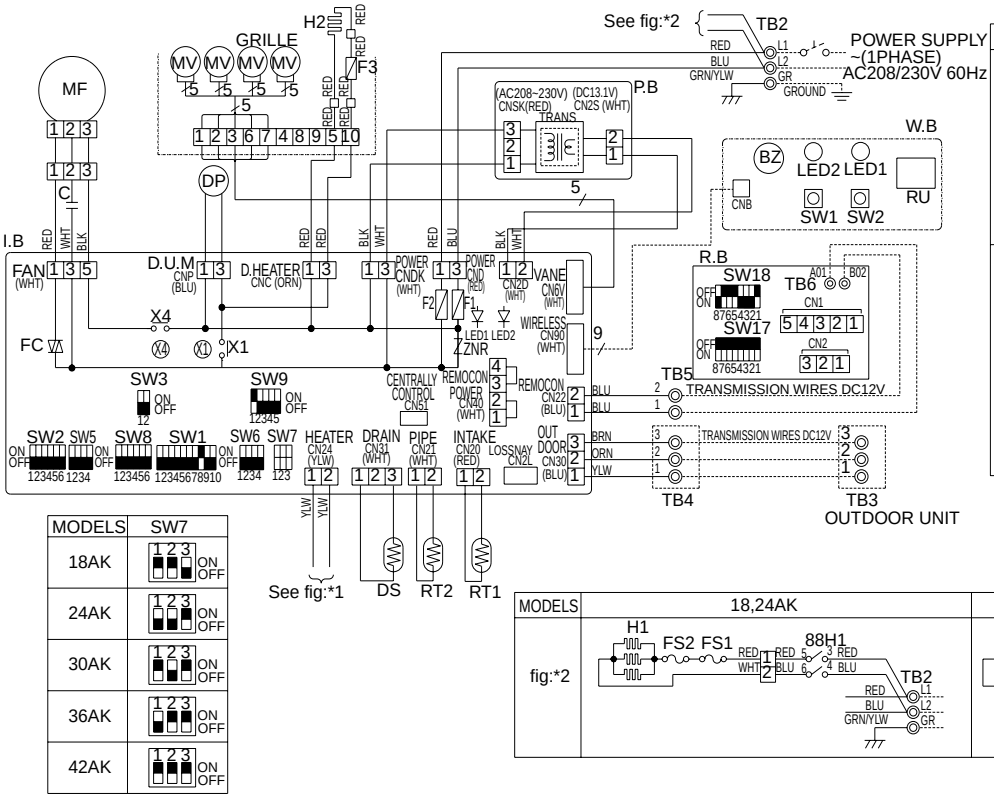


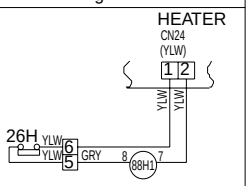
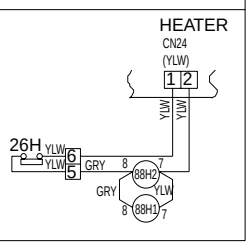
PLH30/36/42AK



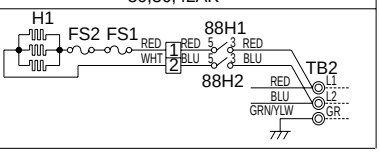
7 WIRING DIAGRAM

MODELS: PLH18/24/30/36/42AK WIRING DIAGRAM



MODELS	fig:*1
18,24AK	
30,36,42AK	

MODELS	SW7
18AK	
24AK	
30AK	
36AK	
42AK	

MODELS	18,24AK	30,36,42AK
fig:*2		

LEGEND

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
P.B	INDOOR POWER BOARD	C	CAPACITOR(FAN MOTOR)	W.B	WIRELESS REMOTE CONTROLLER BOARD
I.B	INDOOR CONTROLLER BOARD	MF	FAN MOTOR	RU	RECEIVING UNIT
CN2L	CONNECTOR(LOSSNAY)	MV	VANE MOTOR	BZ	BUZZER
CN51	CONNECTOR(CENTRALLY CONTROL)	DP	DRAIN-UP MACHINE	LED1	LED(RUN INDICATOR)
FC	FAN PHASE CONTROL	DS	DRAIN SENSOR	LED2	LED(HOT ADJUST)
SW1	SWITCH(FUNCTION SELECTOR)	F3	FUSE(0.16A/250V)	SW1	SWITCH(HEATING ON/OFF)
SW2	SWITCH(ADDRESS SELECTOR)	H2	DEW PREVENTION HEATER	SW2	SWITCH(COOLING ON/OFF)
SW3	SWITCH(EMERGENCY OPERATION)	TB2~TB6	TERMINAL BLOCK	HEATER	
SW5	SWITCH(MODEL SELECTOR)	RT1	ROOM TEMP.THERMISTOR	FS1	THERMAL FUSE(162°F,16A)
SW6	SWITCH(TWIN/TRIPLE SELECTOR)		(32°F/15kΩ,77°F/5.4kΩ DETECT)	FS2	THERMAL FUSE(219°F,16A)
SW7	SWITCH(MODEL SELECTOR)	RT2	PIPE TEMP.THERMISTOR/LIQUID	H1	HEATER
SW8	SWITCH(OPTION)		(32°F/15kΩ,77°F/5.4kΩ DETECT)	26H	HEATER THERMAL SWITCH
SW9	SWITCH(MODEL SELECTOR)	R.B	REMOTE CONTROLLER BOARD	88H1,2	HEATER CONTACTOR
X1	RELAY(DRAIN PUMP)	CN1	CONNECTOR(PROGRAM TIMER)		
X4	RELAY(FAN MOTOR)	CN2	CONNECTOR(REMOTE SWITCH)		
F1,F2	FUSE(6A/250V)	SW17	SWITCH(ADDRESS SELECTOR)		
ZNR	VARISTOR	SW18	SWITCH(FUNCTION SELECTOR)		
LED1	LED(DC12V POWER)				
LED2	LED(DC5V POWER)				

NOTE : If the drain water lift-up mechanism is identified to be defective with the microcomputer doctor during cooling,do not use emergency operation (It causes drain overflow).

NOTES: 1.Since the indoor fan motor(MF)is connected with 230V power,if 208V power is used,change the dip switch(SW8)on the indoor controller board as shown in fig:*3.

fig:*3

Indoor fan motor(MF)for 208V. SW8 ON OFF 123456 → SW8 ON OFF 123456

2.Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.

3.Indoor and outdoor connecting wires are made with polarities, make wiring matching terminal numbers.

4.Symbols used in wiring diagram above are, □□□:Connector, ◎:Terminal block.

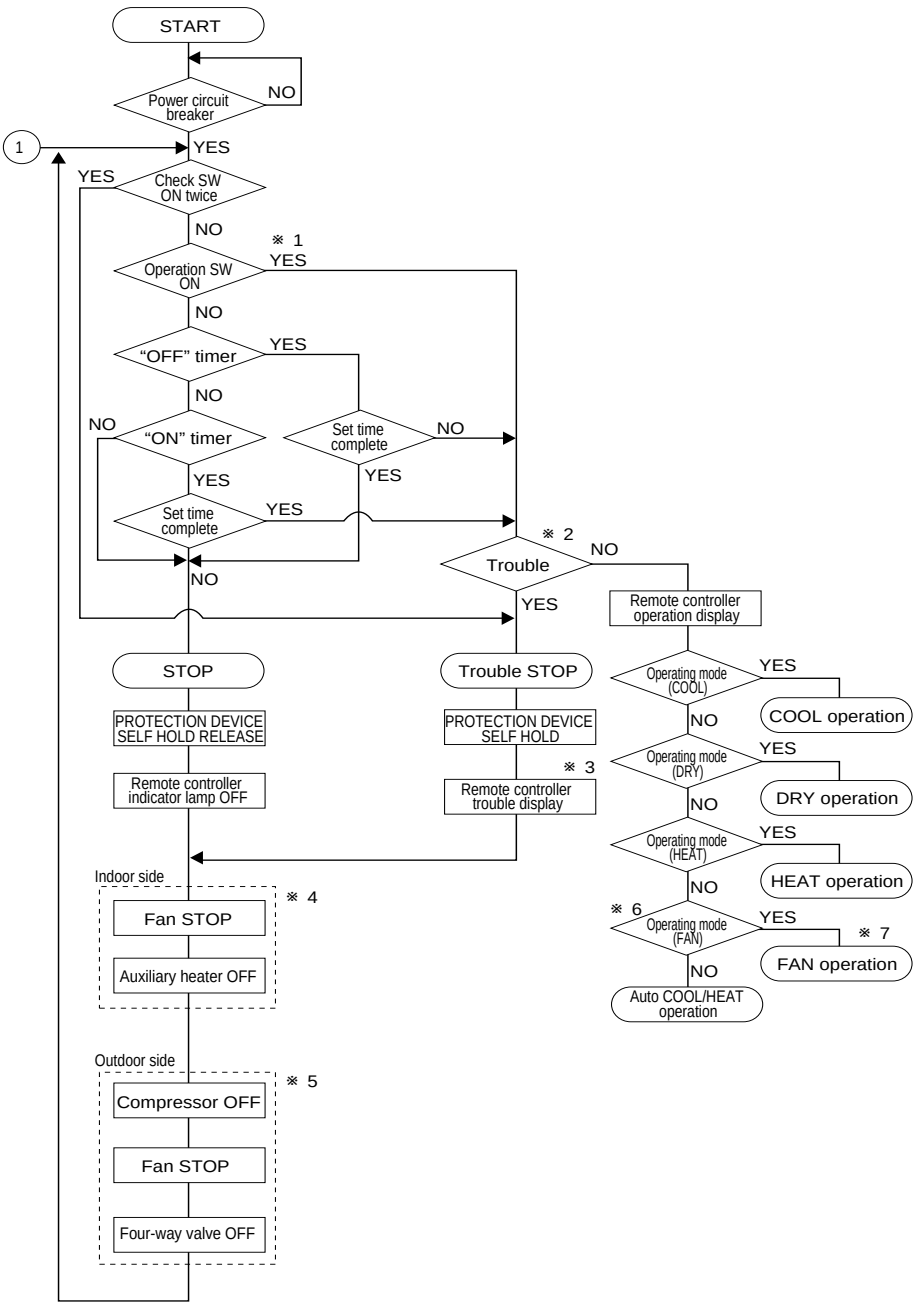
5.Emergency operation
If remote controller or microcomputer fails but there is no other trouble,emergency operation is possible by setting dip switch(SW3<I.B>) on the indoor controller board.

[Check items]
(1)Make sure that no other trouble exist the outdoor unit.Trouble with the outdoor unit prevents emergency operation.
(If any trouble exists the outdoor unit error code"P8"will be displayed on the remote controller and the trouble position will be shown on the outdoor controller board LED. See electric wiring diagram of the outdoor unit for details.)
(2)Make sure that there is no trouble with the indoor fan.
Emergency operation will be a continuous run with the power ON/OFF(ON/OFF with the remote controller is not possible).

[Emergency operation procedure]
(1)Set the dip switch(SW3<I.B>)on the indoor controller board to 1 on and 2 off for cooling. and 1 • 2 on for heating.
(2)Turn on are outdoor unit side circuit breaker,then indoor unit side circuit breaker.
(3)During emergency operation indoor fan runs at high speed but auto-vane does not work.
(4)Thermostat will not function.Cold air blows out for defrosting during heating thus do not operate defrosting for a long time.
(5)Emergency cooling should be limited to 10 hours maximum (the indoor unit heat exchanger may freeze).
(6)After every emergency operation,set all dip switches(SW3<I.B>) to OFF.
(7)Movement of the vanes does not work in emergency operation,therefore you have to slowly set them manually to the appropriate position.

8 OPERATION FLOW-CHART

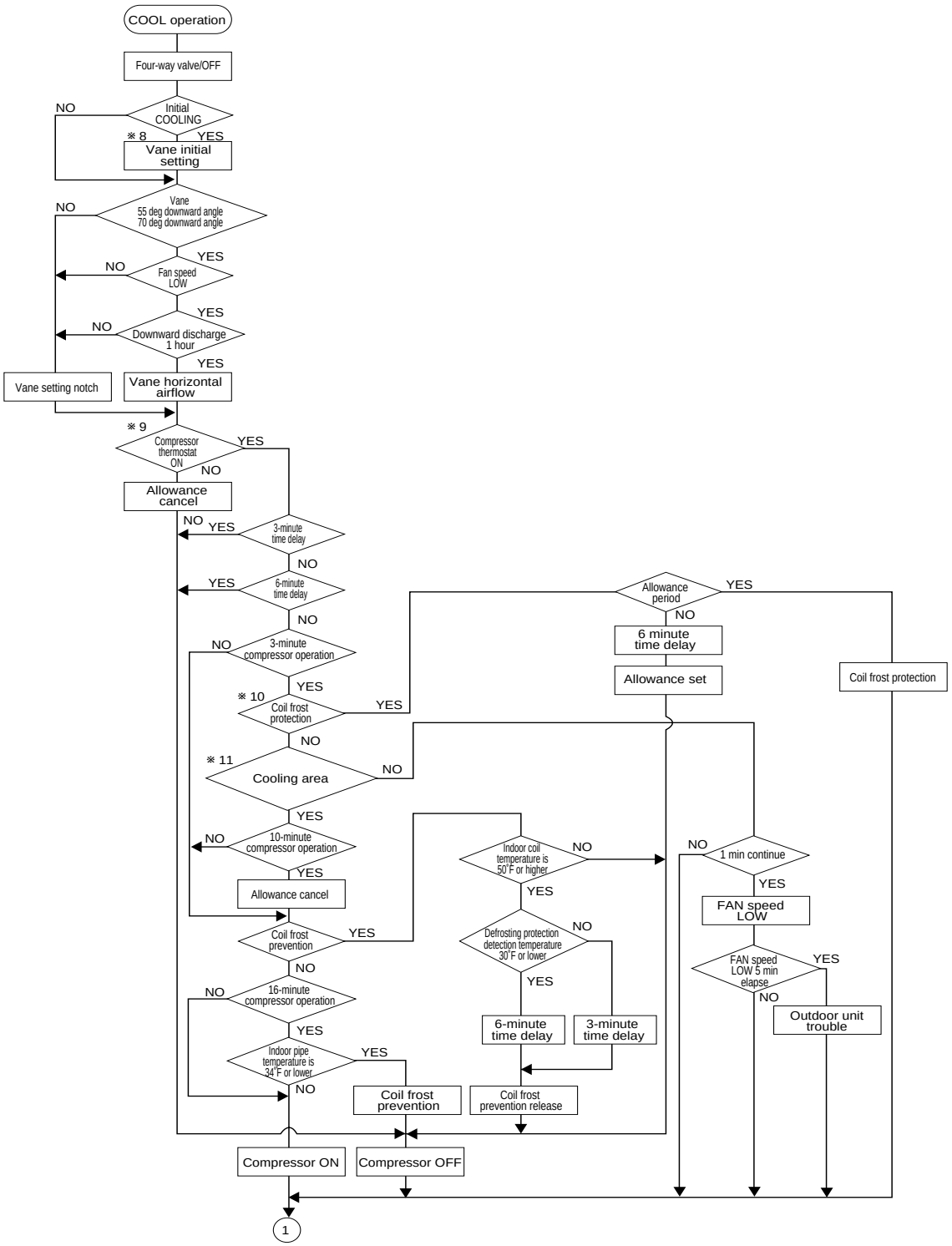
MAIN OPERATION



※1 In addition, the centralized control and remote control can be operated.
※2 The modes which indicate the sources of trouble are listed below.
- E0-Signal transmitting/receiving error
- P1-Room temperature thermistor malfunction
- P2-Indoor coil thermistor malfunction
- P4-Drain sensor malfunction
- P5-Drain overflow
- P6-Coil frost/overheat protection
- P7-System error
- P8-Outdoor unit trouble

※3 The CHECK switch will show if an error has occurred in the past.
※4 Fan runs on low speed for 1 minute in order to remove overheat air.
※5 The 3-minute (6 minutes ··· heating mode) time-delay functions after compressor stops.
※6 FAN or AUTO mode is selected by the indoor dip switch setting.
※7 In FAN mode, fan speed and vane operation depend on the remote controller setting. (Compressor is OFF.)

COOLING OPERATION



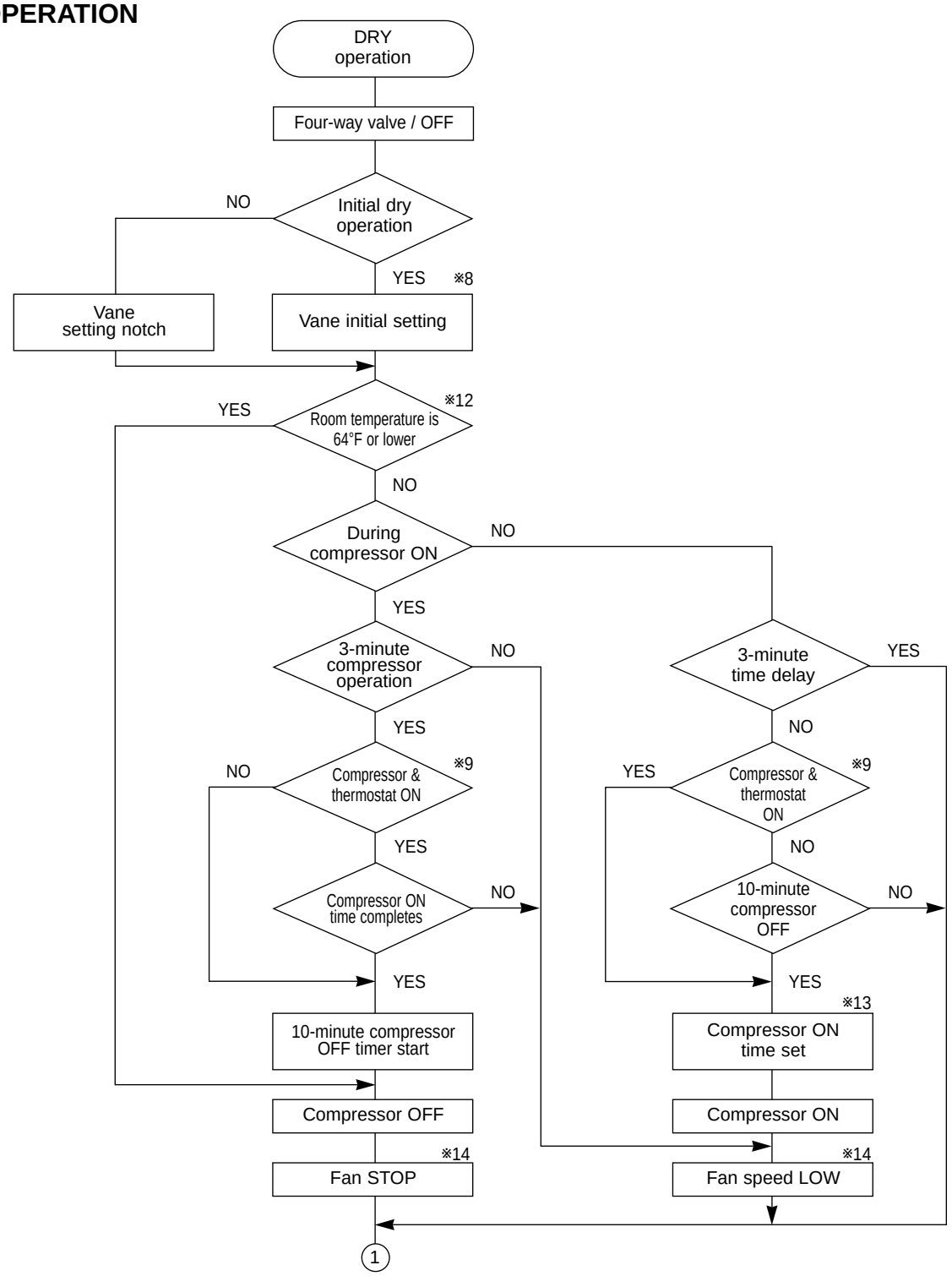
※8 When operation stops or changes to cooling or dry mode, the auto vane turns to a horizontal angle. If operation changes during auto vane SWING, the auto vane will continue to swing.

※9 When operating TEST RUN, the thermostat will be continuously ON.

※10After 3 minute compressor operation, if the indoor coil thermistor reads 5°F or below for 3 minutes, the compressor will stop for 6 minutes.

※11Heating area : Indoor coil temperature is more than 9 degrees above the room temperature.
Cooling area : Indoor coil temperature is more than 9 degrees below the room temperature.
FAN area : Indoor coil temperature is within 9 degrees either way of the room temperature.

DRY OPERATION



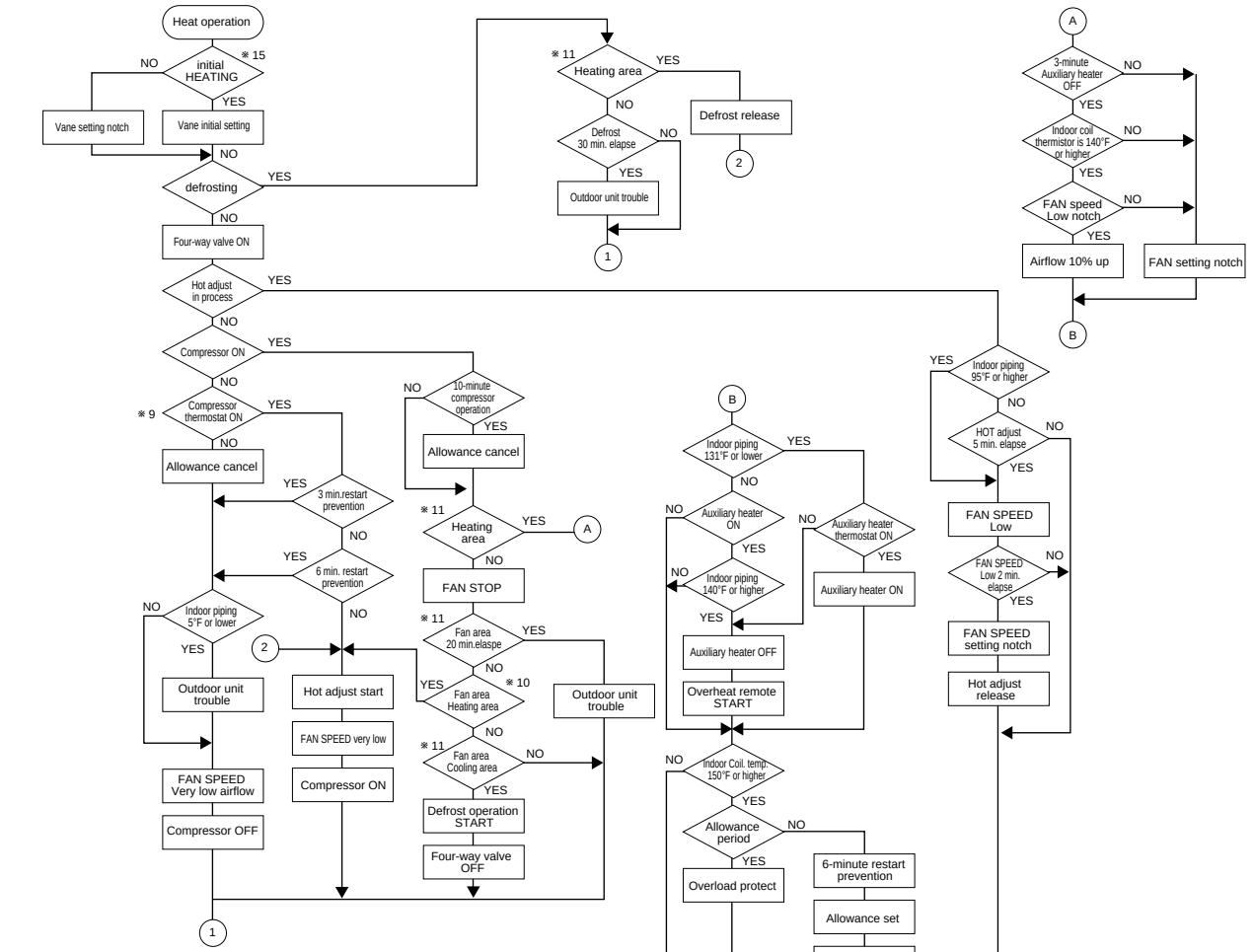
※8—9 Refer to page OC244-25.

※12 When room temperature is 64°F or below, the compressor cannot operate.
When room temperature rises over 64°F the compressor starts after a 3-minute time delay.

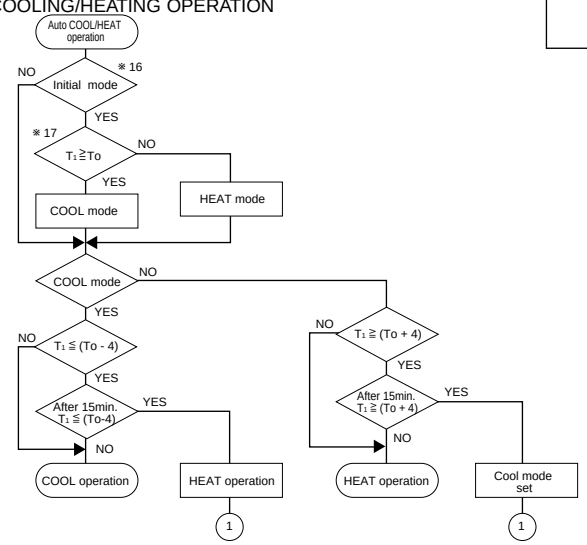
※13 Compressor ON time is decided by room temperature. Refer to page OC244-32.

※14 In dry operation, compressor ON makes the fan speed LOW. Also, when the compressor OFF and the pipe temperature is 79°F or less, the fan stops, or when the compressor OFF and the pipe temperature is below 43°F the fan speed changes to LOW mode.
It is not possible to set the fan speed with the remote controller

HEATING OPERATION



AUTOMATIC COOLING/HEATING OPERATION



※15 (i) Until Low airflow is set while in hot adjustment
(ii)While defrosting (FAN STOP)
(iii)When thermostat is OFF
In the case of(i), (ii) and (iii) above, airflow is horizontal regardless the VANE setting.
※16 When AUTO operation is started, COOL or HEAT mode is selected automatically.
※17 T1 : Room temperature.
To : Set temperature

9 MICROPROCESSOR CONTROL

1. OUTLINE OF MICROPROCESSOR CONTROL

INPUT to remote controller

- OFF-ON switching.
- COOL/DRY-AUTO-HEAT selector switching.
- Thermostat setting.
- TIMER mode selector-switching and Timer setting.
- HIGH-LOW fan speed switching.
- AUTO Vane selector (AIR DISCHARGE) switching.
- TEST RUN switching.
- CHECK mode switching. (Self diagnostic trouble shooting)

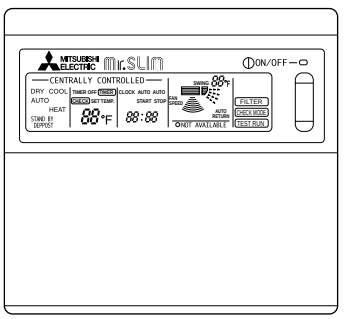
Remote controller board

- Processes and transmits orders.

OUTPUT to remote controller

Remote controller

- LCD indicator

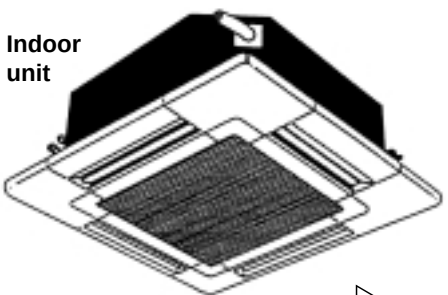


Non-polar, two-wire cable maximum length 550 yards

12VDC

Signal

Indoor unit



INPUT from indoor unit

Indoor controller board

- Receives orders from remote controller and temperature data from indoor unit.
- Processes orders and data.
- Controls indoor and outdoor operation.
- Self diagnostic function.
- ※ System control operation.
- ※ Emergency operation.
- ※ Set by dip switch on indoor controller board.
- Transmits the power to remote controller.

- Room temperature thermistor (RT1)
- Indoor coil thermistor (RT2)
- Drain sensor

OUTPUT to indoor unit

- Auto vane's angle setting.
- Booster heater ON-OFF Control.
- Drain pump : ON-OFF.
- Emergency stop.

1 2 3

Polar three-wire cable

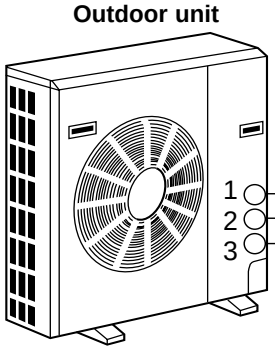
OUTPUT to outdoor unit

- Compressor and outdoor fan : ON-OFF.
- Operation mode change :COOL-HEAT.

Independent Control of Outdoor Unit

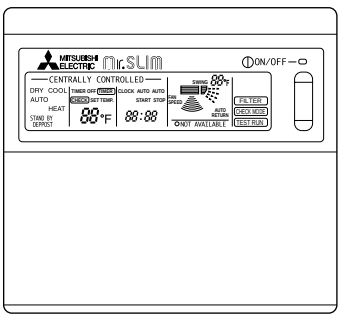
- Compressor protection device working
- Defrosting START-STOP
- Fan speed control.
- Crankcase heater control ON-OFF.
- Self diagnostic function

Outdoor unit



2. INDOOR UNIT CONTROL

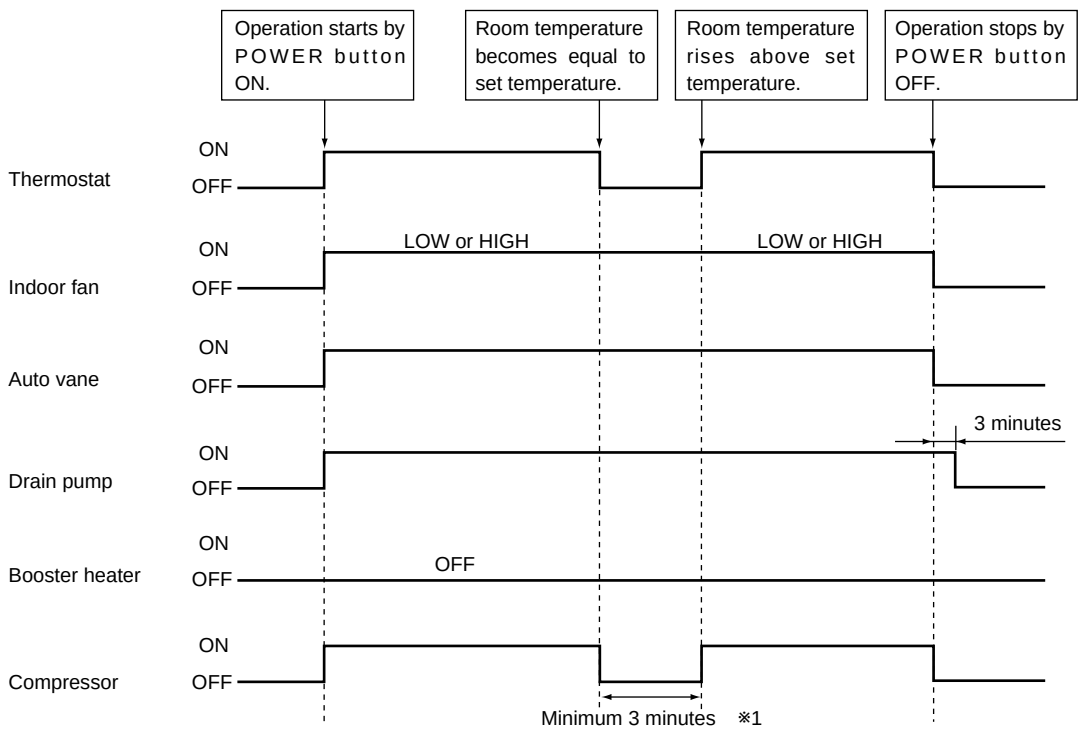
2-1 COOL operation



<How to operate>

① Press POWER ON/OFF button.
② Press the MODE button to display COOL.
③ Press the SET TEMP. button to set the desired temperature.
NOTE: Set temperature changes 2°F when the SET TEMP. button is pressed one time.
Cooling 65 to 87°F.

<COOL operation time chart>



※1 Even if the room temperature rise above the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

① 3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stop.
② The compressor runs when room temperature is higher than set temperature.
The compressor stops when room temperature is equal to or lower than the set temperature.
The compressor maintains the previous state when the room temperature minus the set temperature is 0 degrees or more, or lower than 2 degrees.
③ The compressor stops in check mode or during protective functions.
④ Coil frost prevention
To prevent indoor coil frost, the compressor will stop when the indoor coil thermistor (RT2) reads 34°F or below after the compressor has been continuously operated for at least 16 minutes or more. When the indoor coil temperature rises to 50°F or above, the compressor will start in a 3-minute(※2) time delay.
※2 When the indoor coil temperature is 30°F or less, the compressor starts in 6 minutes.

NOTE : By turning OFF the dip switch SW1-3 on indoor controller board, the start temperature of coil frost prevention changes from 34°F to 36°F.

⑤ Coil frost protection

When indoor coil temperature becomes 5°F or below,coil frost protection will proceed as follows.

<Start condition>

After the compressor has been continuously operated for 3 minutes or more,and the indoor coil temperature has been 5°F or below for 3 minutes,the coil frost protection will start.

<Coil frost protection>

Compressor stops for 6 minutes,and then restarts.

If the start condition is satisfied again during the first 10 minutes of compressor operation,both the indoor and outdoor units stop,displaying a check code of"P6"on the remote controller.

<Termination conditions>

Coil frost protection is released when the start condition is not satisfied again during the allowance, or when the COOL mode stops or changes to another mode.

(2) Indoor fan control

Indoor fan speed LOW/HIGH depends on the remote controller setting.
However, if an outdoor unit abnormality is detected, the indoor fan speed will be LOW, regardless of the remote controller setting.

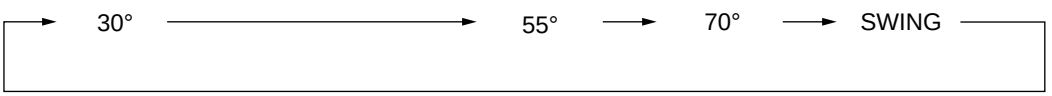
(i) Fan speed LOW/HIGH depends on the remote controller setting regardless of the thermostat ON/OFF.
(ii) Fan speed will remain on LOW if an abnormality in outdoor unit is detected. (5 minutes)

NOTE : Fan stops immediately if the unit stops or the check mode is started.

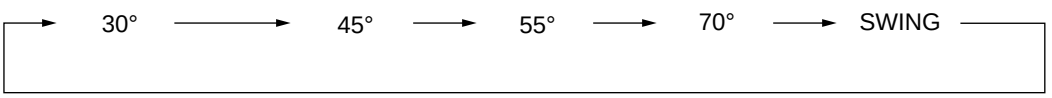
(3) Auto vane control

Auto vane position is set to 30degrees airflow at the start-up of COOL operation.
(a) Vane position set mode & swing mode.
(i) Every time AIR DISCHARGE button is pressed, setting will be changed .
(ii) Airflow direction can be changed with AIR DISCHARGE button.

① Fan speed : LOW

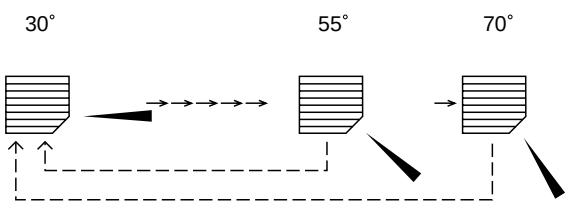


② Fan speed : HIGH

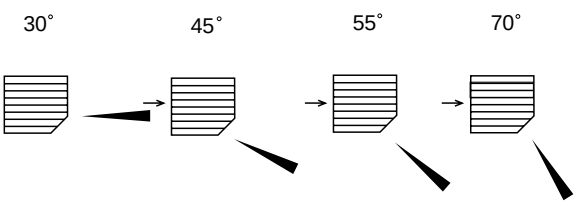


<VANE POSITION>

① Fan speed : LOW



② Fan speed : HIGH



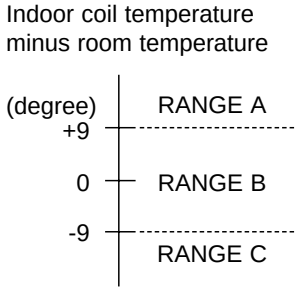
AUTO RETURN

When 55 degrees or 70 degrees airflow is selected with the LOW fan speed in COOL operation, "AUTO RETURN" will appear right side of the air direction display. One hour later, the airflow direction returns to 30 degrees automatically and "AUTO RETURN" will disappear. If the airflow direction is set to 30 degrees during "AUTO RETURN" indication, the time counting for AUTO RETURN is cancelled.

(4) Detecting abnormalities in the outdoor unit

After the compressor has been continuously operated for 3 minutes, if the difference between the indoor coil temperature and room temperature is out of RANGE C for 1 minute, the indoor fan speed will turn to LOW. Five minutes later, if the difference is still out of RANGE C,the outdoor unit is functioning abnormally. Thus, the compressor stops and check code "P8" appears on remote controller.

RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.
RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.
RANGE C : Indoor coil temperature is more than 9 degrees below room temperature.



(5) Drain pump control

The drain pump works in COOL or DRY operation. When operation stops or changes to HEAT mode, the drain pump continues to operate for 3 more minutes. The drain pump does not work in check mode.

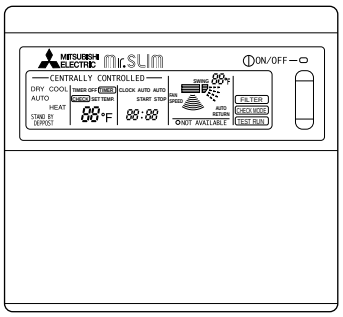
<Drain sensor>

When both the drain pump and unit are operating, the drain sensor detects the temperature. This temperature tells whether the drain water level is above or under the drain sensor. If the drain water level rises above the drain sensor due to a drain pump malfunction, the unit will stop operating in order to prevent drain from overflowing. The check code "P5" on the remote controller will display this occurrence.

(6) Dew prevention heater

To prevent dew from accumulating on the grille, the dew prevention heater is continuously ON during COOL operation. It is independent of the thermostat ON/OFF.

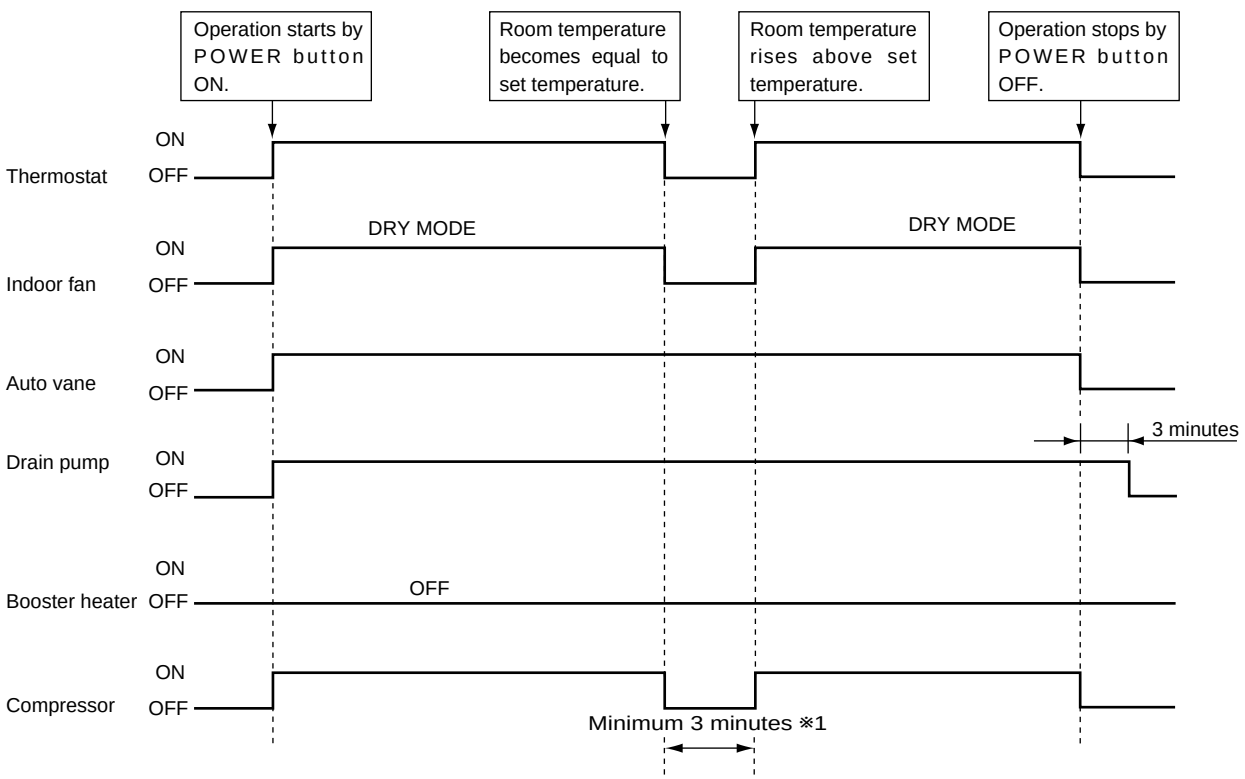
2-2 DRY operation



<How to operate>

① Press POWER ON/OFF button.
② Press the MODE button to display “DRY”
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the SET TEMP. button is pressed one time.
Dry 65 to 87°F

<DRY operation time chart>



※1 Even if the room temperature rises above the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

① 3-minute time delay
To prevent overload, the compressor will not start within 3 minutes after stop.
② The compressor runs when room temperature is higher than set temperature.
The compressor stops when room temperature is equal to or lower than the set temperature.
The compressor maintains the previous state when the room temperature minus the set temperature is 0°F or more, or lower than 2°F.
③ The compressor stops in check mode or during protective functions.

④The compressor will not start when the room temperature is 64°F or below.
The compressor starts intermittent operation when the power is turned ON with room temperature above 64°F. The compressor ON/OFF time depends on the thermostat ON/OFF and the following room temperatures.After 3-minute compressor operation,

- If the room temperature thermistor reads above 82°F with thermostat ON, the compressor will operate for 6 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 79°F~82°F with thermostat ON, the compressor will operate for 4 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads 75°F~79°F with thermostat ON, the compressor will operate for 2 more minutes and then stop for 3 minutes.
- If the room temperature thermistor reads below 75°F with thermostat ON, the compressor will stop for 3 minutes.
- If the thermostat is OFF regardless of room temperature, the compressor will stop for 10 minutes.

⑤Coil frost protection
Coil frost protection in DRY operation is the same as in COOL operation.
⑥Coil frost prevention
Coil frost prevention does not operate in DRY operation.

(2) Indoor fan control

The indoor fan runs on LOW speed during compressor operation. The fan speed cannot be changed with the remote controller. Also, the fan runs on LOW speed when the pipe temperature is 43°F or more, or the compressor is OFF and the pipe temperature is below 43°F.
(a)During compressor OFF

- When the indoor coil temperature is 43°F or above, the indoor fan will stop.
- When the indoor coil temperature is below 43°F, the indoor fan will run on LOW speed.

(b)During compressor ON

- The indoor fan runs on LOW speed.

<Dry mode>
The fan notch is controlled by the indoor coil temperature every 30 seconds.

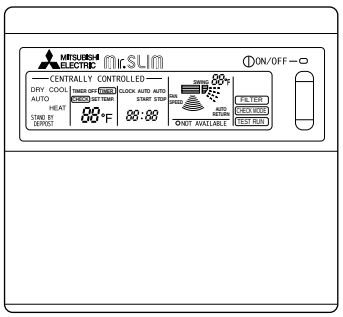
Fan control in DRY operation.

	Pipe temp.	Fan
Compressor OFF	43°F or more	STOP
	Below 43°F	LOW
Compressor ON	All	LOW

(3) Auto vane & drain pump controls
Same as in COOL operation

(4) Detecting abnormalities in the outdoor unit
An abnormality in the outdoor unit can not be detected in DRY operation.

2-3 HEAT operation



<How to operate>

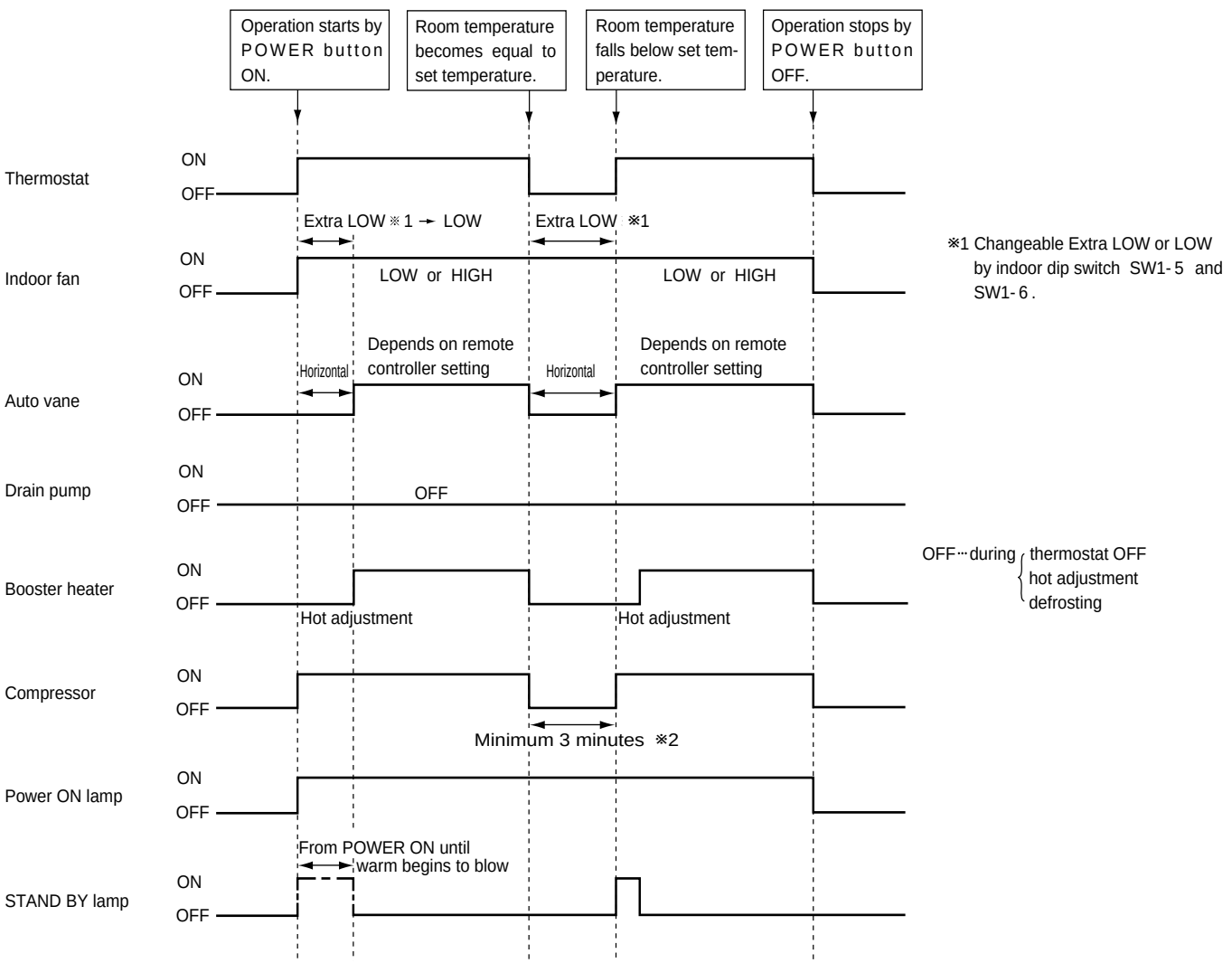
① Press POWER ON/OFF button.
② Press the MODE button to display “HEAT”
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the SET TEMP. button is pressed one time.
Heating 63 to 83°F.

<Display in HEAT operation>

[DEFROST]
The [DEFROST] symbol is only displayed during the defrost operation.

[STANDBY]
The [STANDBY] symbol is only displayed from the time the heating operation starts until the heated air begins to blow.

<HEAT operation time chart>



※2 Even if the room temperature falls below the set temperature during this period, the compressor will not start until this period has ended.

(1) Compressor control

①3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

②The compressor runs when the room temperature is lower than the set temperature.

The compressor stops when the room temperature is equal to or higher than the set temperature.

③The compressor stops in check mode or during protective functions.

④Overheat protection

<Start condition>

When the indoor coil thermistor reads 158°F or above, the overheat protection will start.

<Overheat protection>

The compressor stops for 6 minutes, and then restarts.

If the start condition is satisfied again within 10 minutes of compressor operation, both the indoor and outdoor units stop, displaying a check code of "P6" on the remote controller.

<Termination conditions>

Overheat protection is terminated when the start condition is not satisfied again during the allowance (10-minute compressor operation), when operation mode changes to other mode, or when thermostat turns OFF.

(2) Indoor fan control

(a) Normal control

(i)The indoor fan runs on EXTRA-LOW speed during the thermostat OFF.

EXTRA-LOW speed can be changed to LOW or HIGH speed by setting the dip switch SW1-5 and SW1-6.

If the indoor coil temperature becomes more than 5 degrees below the room temperature during the thermostat OFF, the indoor fan will stop. After, when the indoor coil temperature becomes within 5 degrees of room temperature, the indoor fan will run on EXTRA-LOW speed.

(ii)Hot adjustment

Hot adjustment is a warm-up for HEAT operation

<Start conditions>

The hot adjustment works under any of the following conditions.

- HEAT operation starts.
- Defrosting ends.
- Thermostat turns ON.

[Hot adjustment]

Initially, the indoor fan runs on EXTRA-LOW speed. When 5 minutes have passed or the indoor coil temperature exceeds 95°F, the fan speed changes to LOW. 2 minutes later, the hot adjustment ends. Then, the fan speed depends on the remote controller setting.

(iii)The indoor fan stops when the indoor coil temperature is within 9 degrees either way of room temperature.

(iv)To eliminate the remaining heat, the indoor fan runs for the first 1 minute after the booster heater is turned OFF.

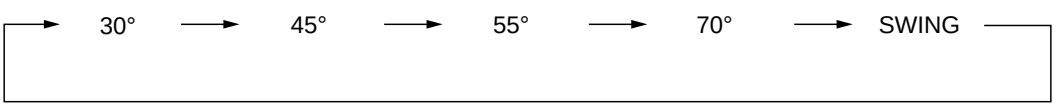
(3) Auto vane control

Auto vane position is set to 70 degrees airflow at the start-up of HEAT operation.

(a) Vane position set mode & swing mode.

(i) Every time AIR DISCHARGE button is pressed, setting will be changed .

(ii) Airflow direction can be changed with AIR DISCHARGE button.



NOTE : In the following cases, the discharge direction is 30° regardless of the remote controller setting.

① During the hot adjustment with fan speed at EXTRA-LOW

② During defrosting with indoor fan OFF

③ During thermostat OFF

(4) Booster heater control

When the room temperature is 6 degrees below the set temperature, the booster heater will turn ON.

When the room temperature is equal to the set temperature, booster heater will turn OFF.

During the hot adjustment, the booster heater will not work.

<Overheat prevention>

When the indoor coil thermistor rises to 140°F or above, the booster heater cannot work.

When the indoor coil thermistor falls to 131°F or below, the booster heater can work.

(5) Detecting abnormalities in the outdoor unit

When the outdoor unit is determined to be abnormal by the following causes, the compressor will stop and the check code " P8 " will appear on the remote controller display.

(i) During compressor ON while hot adjustment is set.

① If the difference between the indoor coil temperature and room temperature is in the RANGE B, the indoor fan will stop.

② Within 20 minutes after entering RANGE B (except for the first 10 seconds),

a) If the temperature difference enters RANGE A, the hot adjustment starts,

b) If the temperature difference is still in RANGE B, the outdoor unit is deemed abnormal.

c) If the temperature difference enters RANGE C, defrosting starts.

③ Within 20 minutes after entering RANGE C, if the temperature difference does not return to RANGE B,the outdoor unit is deemed abnormal.

④ If the temperature difference returns to RANGE B, the next 20 minutes is an allowance period. If the difference enter RANGE A during the allowance, defrosting ends and the hot adjustment starts. If the difference does not enter RANGE A during the allowance, the outdoor unit is deemed abnormal.

(ii) During compressor ON in defrosting

After 30 minutes of defrosting in hot adjustment, if the temperature difference is still in RANGE C, the outdoor unit is determined to be abnormal.

When RANGE B does not change to RANGE A after 20 minutes have passed since RANGE C had outdoor unit is determined to be abnormal.

(iii) During compressor OFF

Not detecting abnormalities.

(6) Indoor coil temperature abnormality detection

An abnormality can be detected during compressor ON, except for the following.

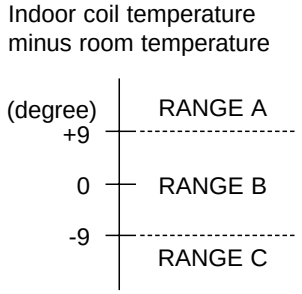
●For the first 30 minutes after the temperature difference between the indoor coil temperature and room temperature enters the RANGE C.

●When the temperature difference enters the RANGE C until it moves to the RANGE B.

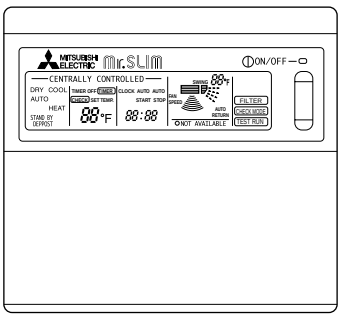
(7) Defrosting operation

After the outdoor unit starts the defrosting operation, when the temperature difference between the indoor coil temperature and room temperature gets out of RANGE A and into RANGE B, the indoor unit starts the defrosting mode. After the outdoor unit stops the defrosting operation, when the temperature difference returns to the RANGE A, the indoor unit stops the defrosting mode. While the indoor unit is in the defrosting mode, the indoor fan and the booster heater stop.

※1 RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.
RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.
RANGE C : Indoor coil temperature is more than 9 degrees below room temperature



2-4 AUTO operation (Automatic COOL/HEAT change over operation)



<How to operate>

① Press POWER ON/OFF button.
② Press the MODE button to display “AUTO”
③ Press the SET TEMP. button to set the desired temperature.
NOTE: The set temperature changes 2°F when the SET TEMP. button is pressed one time.
Automatic 65 to 83°F.
●“AUTOMATIC” works to change by itself the operation mode either to cooling or heating according to the room temperature.

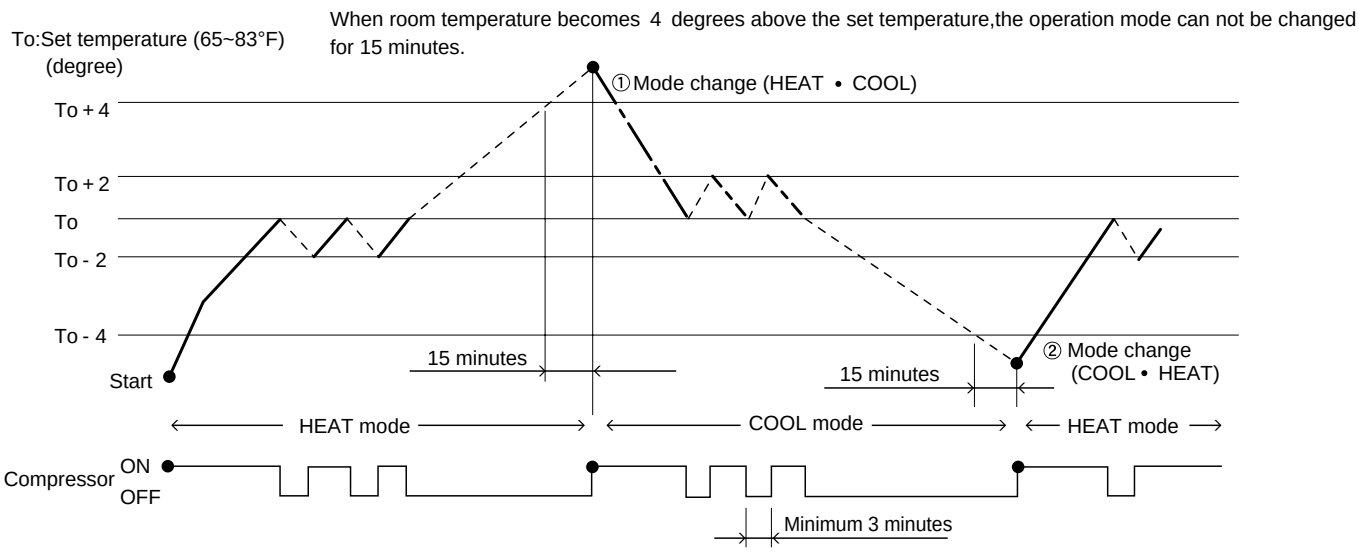
(1) Initial mode

① When AUTO operation starts after unit OFF.
- If the room temperature is higher than the set temperature, operation starts in COOL mode.
- If the room temperature is equal to or lower than the set temperature, operation starts HEAT mode.

② When AUTO operation starts after COOL or HEAT operation, the previous mode continues.

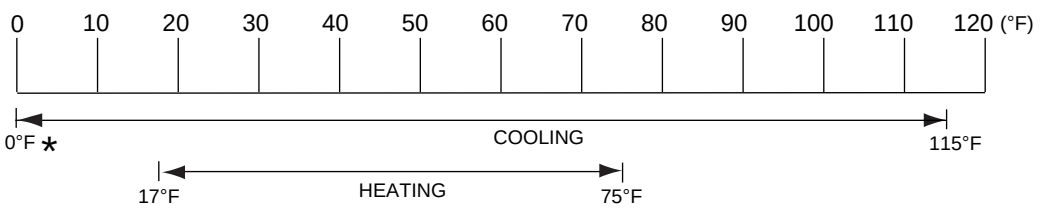
(2) Mode change

① HEAT mode changes to COOL mode when 15 minutes have passed since the room temperature became 4 degrees above the set temperature.
② COOL mode changes to HEAT mode when 15 minutes have passed since the room temperature became 4 degrees below the set temperature.



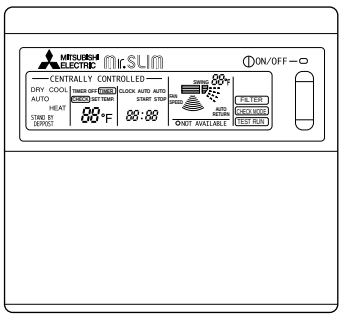
(3) Temperature range

AUTO operation is available under the outside air temperatures as follows.



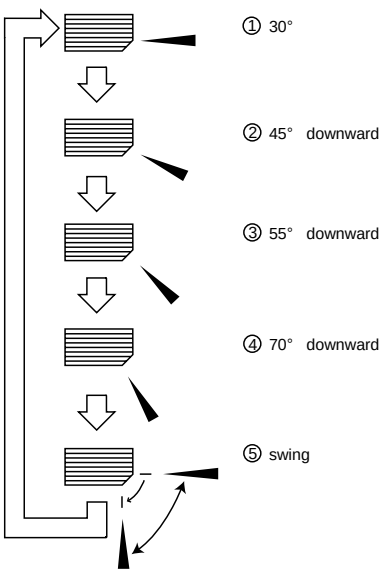
* In case of the wind baffle installed.

2-5 Auto vane control



<How to operate>
To change the air flow direction, press AIR DISCHARGE button.

①	②	③	④	⑤
30°	45°	55°	70°	SWING



Changes by pressing the AIR DISCHARGE button.

Available in COOL operation with fan speed on HIGH or in HEAT operation.
Unavailable in DRY operation.
If fan speed changes from HIGH to LOW during 45° downward airflow in COOL mode, the direction automatically changes to 30°.

(1) COOL/DRY operation

At the start-up of COOL or DRY operation, the airflow direction in automatically set to 30°. After, it can be changed to another direction with AIR DISCHARGE button on the remote controller.

<Auto return>

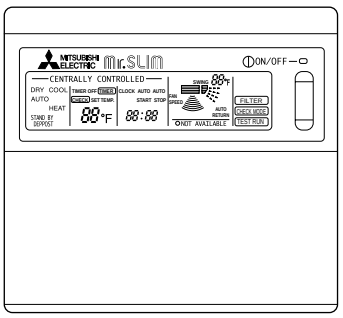
When 55° or 70° airflow is set with fan speed in LOW, “AUTO RETURN” appears right side of the air direction. One hour later the direction changes to 30 degrees, automatically and “AUTO RETURN” disappears.

(2) HEAT operation

At the start-up of HEAT operation, airflow direction depends on the setting of the last operation.
After, it can be changed to another direction with AIR DISCHARGE button. The airflow direction shifts to 30° regardless of the remote controller settings under any of the following conditions.

- Thermostat OFF
- Defrosting
- Indoor fan speed EXTRA-LOW in hot adjustment

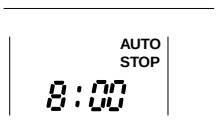
2-6 TIMER operation
WIRED REMOTE CONTROLLER



<Timer function>
AUTO STOP ·····The air conditioner stops after the set time lapses.
AUTO START ·····The air conditioner starts after the set time lapses.
AUTO OFF ·····Timer is not active.

<How to operate>
1. Press POWER ON/OFF button.
2. Press “TIMER ON/OFF” button to select AUTO STOP or AUTO START.
3. Press “CLOCK/TIMER” button to set desired time.
   Time setting is in 1 hour units for up to 24 hours.
   Each time TIMER SET button is pressed, set time increases by 1 hour. When TIMER SET button is pressed and held, the set time increases by 1 hour every 0.5 seconds.
4. To cancel the timer operation, press POWER ON/OFF button.

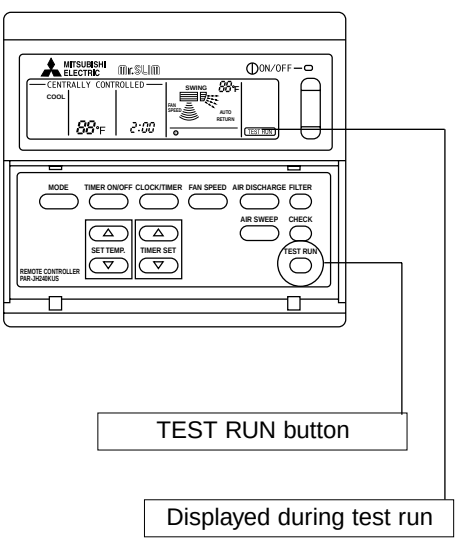
<Timer setting example>



This setting will stop the operation in 8hours.
With the lapse of time, time display changes in 1hour units, showing remaining time.

2-7 Test run
<Before test run>
- After installing, wiring, and piping the indoor and outdoor units, check for refrigerant leakage, looseness in power supply or control wiring, and mistaken polarity.
- Use a 500-volt measure to check the resistance between the power supply terminal block and ground to make sure that it is at least 1.0MΩ.

Attention:
Do not use the air conditioner if resistance is less than 1.0MΩ.



<How to operate>
1. Turn ON main breaker.
2. Press TEST RUN button twice. “TEST RUN” is displayed on remote controller.
3. Select “COOL” with MODE button to check that cool air is beginning discharged.
   Select “HEAT” with MODE button to check that warm air is beginning discharged.(after a while)
4. Select LOW/HIGH with FAN SPEED button to check that the fan speed changes properly.
5. Press AIR DISCHARGE button to check auto vane operation.
6. Check outdoor fan operation.
7. Check compressor operation referring to the indoor coil temperature code displayed on the remote controller.
8. After checking, press the ON/OFF button.

·The test run works for 2 hours and stops automatically.
To cancel the test run, press ON / OFF button or TIMER ON / OFF button.

(1) Indoor coil temperature code

During the test run, the indoor coil temperature code from 1 to 15 is displayed on the remote controller instead of room temperature. The code should fall with the lapse of time in normal COOL operation, and should rise in normal HEAT operation.

Code	1	2	3	4	5	6	7	8
Indoor coil temperature	~34(36)°F	36(37)°F~50°F	~59°F	~68°F	~77°F	~86°F	~95°F	~104°F
Code	9	10	11	12	13	14	15	
Indoor coil temperature	~113°F	~122°F	~131°F	~140°F	~158°F	~191°F	Thermistor abnormality	

(2) Trouble during test run

- If the unit malfunctions during the test run, refer to section 10 in this manual entitled “TROUBLESHOOTING.”
- When the optional program timer is connected to the conditioner, refer to its operating instructions.

2-8 Emergency operation

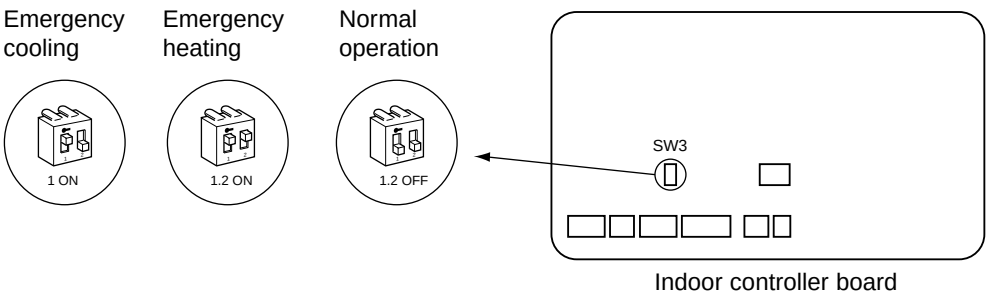
When the remote controller or microprocessor malfunctions but all other parts are normal, emergency operation is started by setting the dip switch SW3 on the indoor controller board.

<Before emergency operation>

1. Make sure the compressor and the indoor fan are operating normally.
2. Locate the defect with the self-diagnostic function. When the self-diagnostic function indicates “protective function is working”, release the protective function before starting the emergency operation.
   CAUTION: When the self-diagnostic function indicates a check code of “P5” (drain pump malfunction), do not start the emergency operation because the drain may overflow.

<How to operate>

1. For emergency cooling, set the dip switch SW3-1 to ON and SW3-2 to OFF.
   For emergency heating, set the dip switch SW3-1,2 to ON.



Indoor controller board

2. Turn ON the outdoor unit breaker and then ON the indoor unit breaker.
   Emergency operation will now start.
3. During emergency operation, the indoor fan operates on high speed, the auto vanes do not operate.
4. To stop emergency operation, turn OFF the indoor unit breaker.
5. Movements of the vanes do not work in emergency operation, therefore you have to slowly set them manually to the appropriate position.

NOTE: The remote controller POWER ON/OFF button can not start/stop emergency operations.

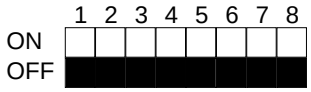
CAUTION: Do not use emergency cooling for more than 10 hours, as the indoor coil may freeze.

2-9 Dip switch functions

Each figure shows the initial factory setting.

(1). On remote controller board

1. SW17(Address selector)

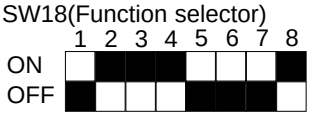


SW17-1~6) For address setting

SW17-7) When two remote controllers are used,this switch sets the controller function.
OFF:The remote controller is set as a main controller.
ON:The remote controller is set as a sub controller.

SW17-8) Switch for system back-up.
OFF:Without back-up
ON:With back-up

2. SW18(Function selector)



SW18-1) Switch for timer
OFF:Single day ON:timer every day

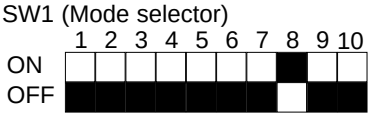
SW18-2) Switch for filter sign
OFF:filter sign absent
ON:filter sign present

SW18-3) Switch for filter sign time setting.
OFF:100Hr ON:2500Hr

SW18-4~8) Not yet used.

(2). On indoor controller board

1. SW1 (Mode selector)



SW1-1) Switch that changes between FAN mode and AUTO mode
OFF:AUTO mode for models with heat pump
ON:Fan mode for models without heat pump

SW1-2) Switch for drain pump
OFF:The drain pump works in COOL and DRY operation.
ON:The drain pump works in both COOL and DRY and HEAT operation.

SW1-3) Switch to change the temperature to start coil frost prevention
OFF:34°F
ON:36°F

SW1-4) Switch for set temperature adjustment in HEAT mode
During HEAT operation,warm air collects near the ceiling.When the indoor unit is installed near the ceiling,the temperature read by room temperature thermistor differs from the actual living-space temperature by about 7 degrees. Therefore,the room temperature read by room temperature thermistor must be lowered by 7 degrees.
OFF:7-degree adjustment
ON:NO adjustment

SW1-5) Switch for fan speed during thermostat OFF in HEAT operation
OFF:EXTRA LOW
ON:LOW

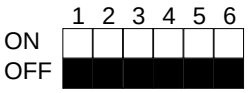
SW1-6) Switch for fan speed during thermostat OFF in HEAT operation
OFF:EXTRA LOW or LOW(set with SW1-5)
ON:LOW or HIGH(set with remote controller)

SW1-7) Switch for detecting abnormalities in the outdoor unit abnormality detection
OFF:When an abnormality occurs,it is detected.
ON:Even if an abnormality occurs,it can not be detected.

SW1-8) Switch for auto restart function
OFF:This function does not work
ON:This function works.

SW1-9, 10) Not yet used.

2. SW2 (Address selector)



Used in setting the unit-address for group control.
For further information,refer to page OC244-55.

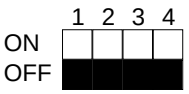
3. SW3 (Emergency operation switch)

Normal operation

For emergency cooling

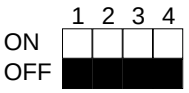
For emergency heating

4. SW5 (Model selector)



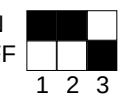
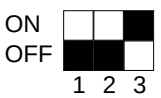
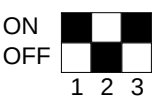
SW5-1) Not yet used
SW5-2) OFF:For models with heat pump
ON: For models with cooling only
SW5-3) OFF:Auto vane angle 30°→45°→55°→70°
ON: Auto vane angle 25°→40°→55°→70°
SW5-4) Fresh air intake OFF:Fresh air in not taken in
ON: Fresh air is taken in

5. SW6 (Address selector)

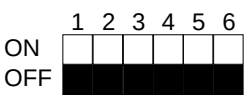


This switch is not available for series PLH.

6. SW7 (Model selector)
Switch to set the output of phase-controlled indoor fan motor.
Address setting is available at any time.
The initial factory setting by is based on each capacity.

Service Ref.	PLH18AK	PLH24AK	PLH30AK	PLH36AK	PLH42AK
SW7					

7. SW8



SW8-1~2) Ceiling high type switch
SW8-3~4) Discharge direction selector
} See page OC244-49.
SW8-5) Option selector
OFF:Standard
ON: When mounting the optional high efficiency filter.
SW8-6) OFF:For 230V power supply
ON: For 208V power supply

2-10. INDOOR FAN CONTROL

Fan motor max. rotational frequency

Service Ref.	Voltage [V]	100% rotational frequency(rpm) 60Hz
PLH18AK	208/230	600/650
PLH24,30AK	208/230	710/790
PLH36,42AK	208/230	760/830

10 TROUBLESHOOTING

1.TROUBLES IN TEST RUN

<table>
<tr><th>Symptom</th><th>Cause</th><th>Check points</th></tr>
<tr><td>The display “CENTRALLY CONTROLLED” on remote controller does not disappear.</td><td>1) Wrong address setting of remote controller/indoor controller board.
2) Timer adapter is connected to the remote controller.
3) Signal transmission error between indoor unit and remote controller.</td><td>1) Check the address setting of remote controller and indoor controller.
2) Make sure the timer adapter is used correctly.
3) ① Turn another remote controller’s DIP SW17-7 ON to make it sub controller.
② Connect the sub controller to the unit, and turn circuit breaker ON.
● If the display “centrally controlled” disappears, replace the original remote controller.
● If the display remains the same, replace the indoor controller board.</td></tr>
<tr><td>When remote controller POWER button is turned ON, the check code “E0”appears.</td><td>1) Signal transmission error between indoor unit and remote controller</td><td>1) ① Connect a sub remote controller.
② Turn circuit breaker ON.
If the display “centrally controlled” remains, replace the indoor controller board.
③ If the display disappears, turn the remote controller POWER button ON and check as follows.
<table>
<tr><th></th><th>Remote controller</th><th>Sub remote controller</th><th>Malfunction</th></tr>
<tr><td>1</td><td>Operating Display</td><td>E0 Display</td><td>Malfunction of indoor Unit</td></tr>
<tr><td>2</td><td>Operating Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr>
<tr><td>3</td><td>No Display</td><td>E0 Display</td><td>Malfunction of indoor Unit and Remote Controller</td></tr>
<tr><td>4</td><td>No Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr>
</table></td></tr>
<tr><td>When remote controller POWER button is turned ON, operating display appears, but disappears soon.</td><td>1) Short circuit of indoor/outdoor connecting wire
2) Short circuit of transmission wire.
3) Wrong operation of remote controller due to noise wave emitted by other appliances.</td><td>1), 2) Check the wire
3) Turn the circuit breaker OFF, and then turn ON.
If the remote controller remains abnormal, despite the above measures, replace the indoor controller board.</td></tr>
<tr><td>Despite turning POWER button ON, the remote controller display does not appear.</td><td>1) Damaged remote controller.
2) Short circuit of transmission wire.
3) Bad contact of indoor CN40.
4) CN40 is attached to a sub unit.
5) Damaged power board.
6) Bad contact of CN2D.
7) Blown fuse.
8) Circuit breaker OFF.</td><td>1) Measure the voltage between terminals of remote controller. If no voltage, remove the terminals and measure the voltage between wires. If the voltage is between 6VDC and 12V, replace the remote controller.
2) ~ 8) Check each point.
If it is not defective, replace the indoor controller board.</td></tr>
</table>

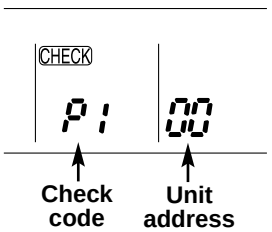
2. SELF DIAGNOSTIC FUNCTION WITH REMOTE CONTROLLER (WIRED REMOTE CONTROLLER)

2-1 When malfunction occurs during operation

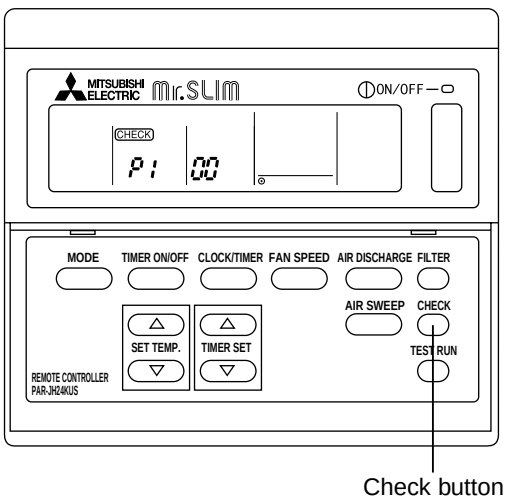
When a malfunction occurs, the indoor and outdoor units stop and the malfunction is displayed on the LCD of the remote controller.

(1) ON the set temperature display part, “CHECK” appears, and the unit address and the check code are displayed alternately at one-second intervals. (Check mode)

Example



CHECK mode



Check button

(2) When one remote controller controls several units in the group control, the LCD shows the unit address and check code of the first malfunctioning unit.

(3) To cancel the check mode, press the ⏻ ON/OFF button. In remote ON/OFF control, press the remote ⏻ ON/OFF switch. In centralize control, turn OFF the ⏻ ON/OFF button of centralize controller.

NOTE: The latest check code is memorize, even if the check mode is cancelled by the way mentioned above. It takes 60 seconds maximum to display the memorize check code.

2-2 How to use the self diagnostic function for service

A. For normal control with one unit and one remote controller

(1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.

(2) During the self diagnostic function, “CHECK MODE” appears at two positions on the remote controller display. Then, at least 10 seconds later, the unit address and the check code is alternately displayed at one-second intervals.

(3) Check and repair the unit according to the check code. (Refer to next page.)

B. For group control using one remote controller

(1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.

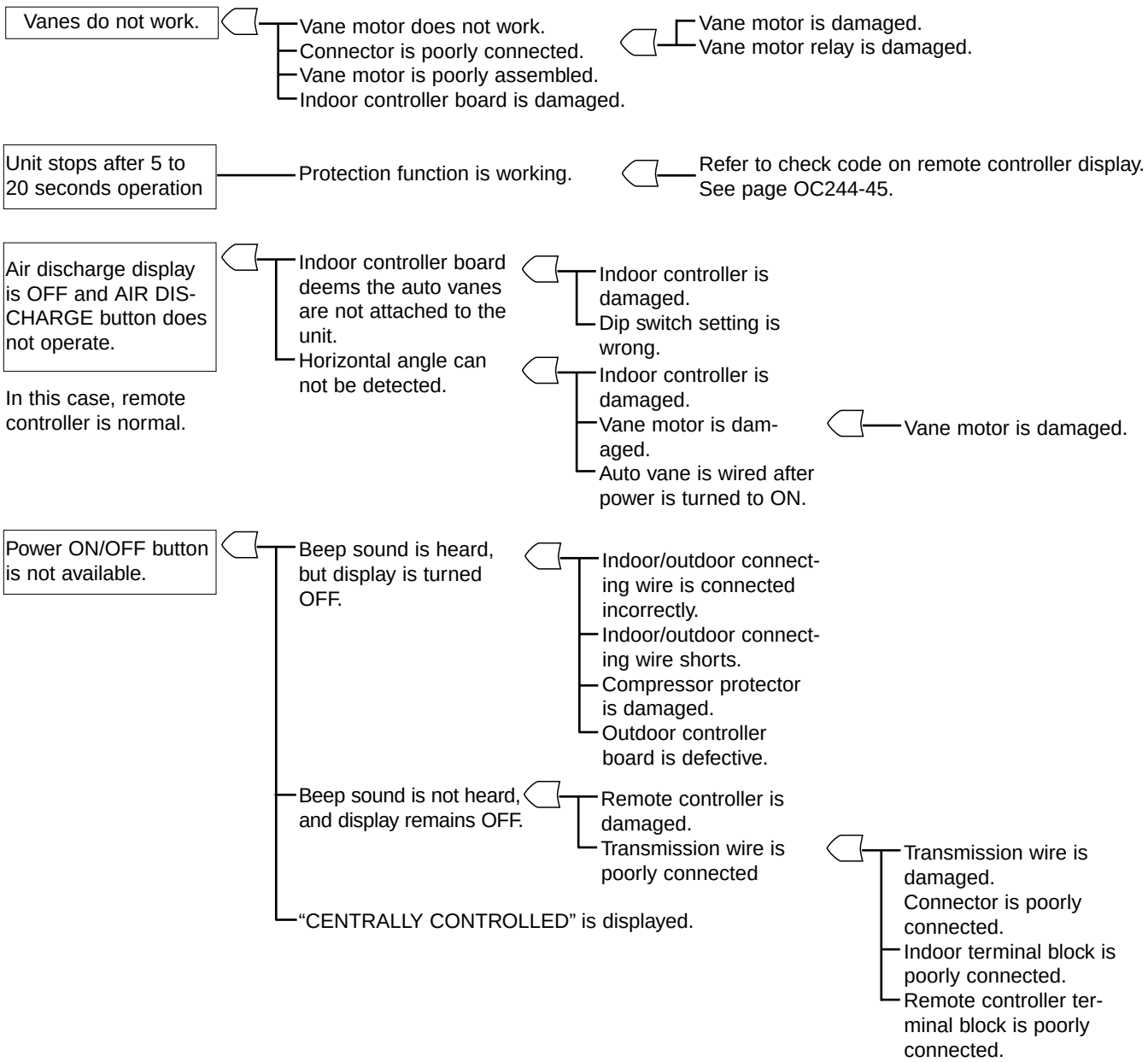
(2) Press the △ SET TEMP. button or ▽ SET TEMP. button on the remote controller to advance or go back to the unit address. Each time △ SET TEMP. button is pressed, the unit address advances by one. Each time ▽ SET TEMP. button is pressed, the unit address goes back by one.
The check code and the unit address, appear alternately.

(3) The check code “U8” means no malfunction has occurred since installation.
The check code “E0” means the following conditions:
- The unit address displayed on the remote controller does not apply to any unit.
- power is not supplied to the unit.
- Signal transmitting/receiving circuit is abnormal.

(4) Check and repair the unit according to the check code. (Refer to next page.)

Check code	Diagnosis of malfunction	Cause	Check points
E0	Signal transmitting/receiving error (Indoor controller does not respond to remote controller signal.)	During individual unit control 1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal.	1) Check the transmission wire. 2) Check with another remote controller. If “E0” is still indicated, replace the indoor controller board. If other check code appears. replace the original remote controller.
P1	Abnormality of room temperature thermistor (RT1)	1) Bad contact of thermistor 2) Damaged thermistor	1) Check the thermistor. 2) Measure the resistance of the thermistor. Normal resistance should be as follows. 32°F···15kΩ 86°F ···4.3kΩ 50°F···9.6kΩ 104°F ···3.0kΩ 68°F···6.3kΩ If the resistance is normal, replace the indoor controller board.
P2	Abnormality of indoor coil thermistor (RT2)		
P3	Signal transmission error (Remote controller does not respond to indoor controller signal.)	1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal. 3) Wrong operation due to noise wave emitted by other appliances	1) Check the transmission wire. 2) Check with another remote controller. If “P3” is still indicated, replace the indoor board. If other check code appears, replace the original remote controller. 3) Short-circuit between 1 and 2 of CN40 and attach CN40 to the following units. ● Second unit in twin control ● Second and third units in triple control ● Sub units in group control
P4	Abnormality of drain sensor	1) Bad contact of transmission wire 2) Damaged thermistor	1) Check the connector. 2) Measure the resistance of the thermistor 1 - 3. 32°F ··6kΩ 59°F···3.2kΩ 86°F···1.8kΩ 41°F ··4.8kΩ 68°F···2.6kΩ 95°F···1.5kΩ 50°F ··3.9kΩ 77°F···2.2kΩ 104°F··1.3kΩ If the resistance is normal, replace the indoor controller board.
P5	Malfunction of drain pump	1) Malfunction of drain pump 2) Damaged drain sensor	1) Check the drain pump. 2) ● Check the drain sensor. (Check the drop of water is on.) If the resistance is normal, replace the indoor controller board.
P6	Freezing protection/ overheating protection is working.	1) Short cycle of air cycle 2) Dirty air filter 3) Damaged fan 4) Abnormal refrigerant	1) Clear obstructions from the air cycle. 2) Clean the air filter 3) Check the fan. 4) Check the refrigerant temperature.
P7	System error	1) Wrong address-setting 2) Signal transmitting/receiving circuit of remote controller is abnormal. 3) Wrong SW6-setting	1) Check the address-setting. 2) Check with another remote controller. If check code other than “P7” appears, replace the original remote controller. 3) Check SW6 setting.
P8	Abnormality in outdoor unit	1) Wrong wiring of indoor/outdoor connecting wire 2) Reversed phase 3) Protection device is working 4) Damaged outdoor coil thermistor	1) Check the indoor/outdoor connecting wire. 2) Change the connection of electric wiring. 3) Check the protection device. 4) Measure the resistance of the outdoor coil thermistor. If the resistance is normal, replace the outdoor controller board.

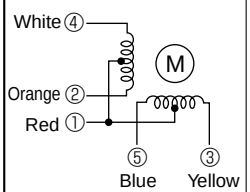
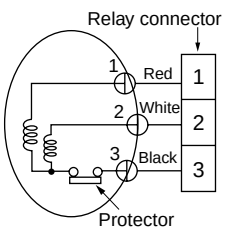
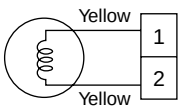
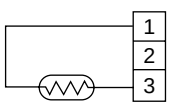
3. OTHER TROUBLES AND CAUSES


Vanes do not work.
Vane motor does not work.
Vane motor is damaged.
Vane motor relay is damaged.
Connector is poorly connected.
Vane motor is poorly assembled.
Indoor controller board is damaged.
Unit stops after 5 to 20 seconds operation
Protection function is working.
Refer to check code on remote controller display. See page OC244-45.
Air discharge display is OFF and AIR DISCHARGE button does not operate.
In this case, remote controller is normal.
Indoor controller board deems the auto vanes are not attached to the unit.
Indoor controller is damaged.
Dip switch setting is wrong.
Horizontal angle can not be detected.
Indoor controller is damaged.
Vane motor is damaged.
Vane motor is damaged.
Auto vane is wired after power is turned to ON.
Power ON/OFF button is not available.
Beep sound is heard, but display is turned OFF.
Indoor/outdoor connecting wire is connected incorrectly.
Indoor/outdoor connecting wire shorts.
Compressor protector is damaged.
Outdoor controller board is defective.
Beep sound is not heard, and display remains OFF.
Remote controller is damaged.
Transmission wire is poorly connected
Transmission wire is damaged.
Connector is poorly connected.
Indoor terminal block is poorly connected.
Remote controller terminal block is poorly connected.
“CENTRALLY CONTROLLED” is displayed.

4. How to check the parts PLH18AK/PLH24AK/PLH30AK/PLH36AK/PLH42AK

<table>
<tr><th>Parts name</th><th>Check points</th></tr>
<tr><td>Room temperature thermistor (RT1)

Liquid pipe thermistor (RT2)</td><td>Disconnect the connector then measure the resistance using a tester.
(Surrounding temperature 50°F~86°F)

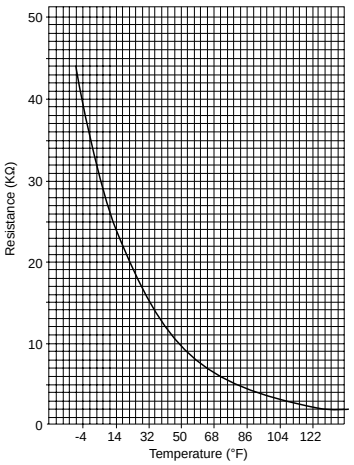
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>4.3kΩ~9.6kΩ</td><td>Open or short</td></tr></table>(Refer to the thermistor)</td></tr>
<tr><td>Vane motor
 
</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)
<table><tr><th>Connector</th><th>Normal</th><th>Abnormal</th></tr><tr><td>Red — Yellow</td><td rowspan="4">300Ω</td><td rowspan="4">Open or short</td></tr><tr><td>Red — Blue</td></tr><tr><td>Red — Orange</td></tr><tr><td>Red — White</td></tr></table></td></tr>
<tr><td>Fan motor
 
</td><td>Measure the resistance between the terminals using a tester.
<table><tr><th rowspan="3">Motor terminal
or
Relay connector</th><th colspan="3">Normal</th><th rowspan="3">Abnormal</th></tr><tr><th colspan="3">PLH</th></tr><tr><th>18AK</th><th>24,30AK</th><th>36,42AK</th></tr><tr><td>Red-Black</td><td>87.2Ω</td><td>32.6Ω</td><td>28.7Ω</td><td rowspan="2">Open or short</td></tr><tr><td>White-Black</td><td>104.1Ω</td><td>40.7Ω</td><td>41.6Ω</td></tr></table></td></tr>
<tr><td>Drain pump
 
</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 68°F~86°F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>319Ω</td><td>Open or short</td></tr></table></td></tr>
<tr><td>Drain sensor
 
</td><td>Measure the resistance between the terminals using a tester.
(Surrounding temperature 50°F~86°F)
<table><tr><th>Normal</th><th>Abnormal</th></tr><tr><td>0.6kΩ~6.0kΩ</td><td>Open or short</td></tr></table>(Refer to the thermistor)</td></tr>
</table>

<Thermistor Characteristic graph>

Thermistor for lower temperature

Room temperature thermistor(RT1)
Liquid pipe thermistor(RT2)

< Thermistor for lower temperature >



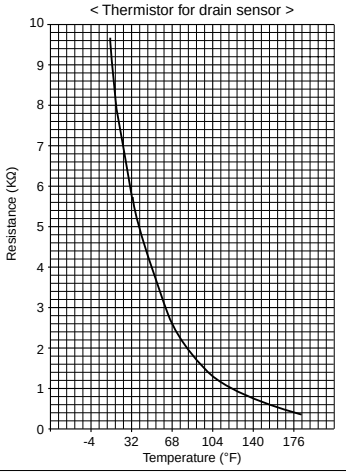
Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

$$Rt=15\exp\{3480(\frac{1}{273+\{(t-32)/1.8\}}-\frac{1}{273})\}$$

32°F	15kΩ
50°F	9.6kΩ
68°F	6.3kΩ
77°F	5.2kΩ
86°F	4.3kΩ
104°F	3.0kΩ

Thermistor for drain sensor

< Thermistor for drain sensor >



Thermistor R_0=6.0kΩ ±5%
Fixed number of B=3390kΩ ±2%

$$Rt=6\exp\{3390(\frac{1}{273+\{(t-32)/1.8\}}-\frac{1}{273})\}$$

32°F	6.0kΩ
50°F	3.9kΩ
68°F	2.6kΩ
77°F	2.2kΩ
86°F	1.8kΩ
104°F	1.3kΩ

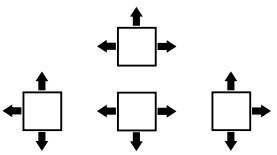
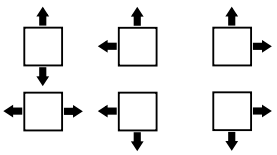
11 4-WAY AIR FLOW SYSTEM

1. Placement of the air outlets

• For this grille, the blowout direction comes in 11 patterns.
Also, by setting the dip switches (SW8-3, SW8-4) on the indoor board to the appropriate settings, you can adjust the air flow and speed. Select the settings from Table according to the location in which you want to install the unit.

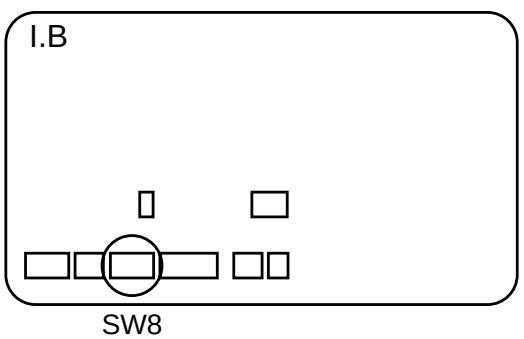
1) Decide on the pattern of the airflow direction.

<Table 1>

Blowout direction pattern	4-direction	3-direction	2-direction
	Pattern 1 Factory setting	Pattern 4 One air outlet fully closed	Pattern 6 Two air outlet fully closed
			

Note1.
For 3 and 2-directional, please use the air outlet shutter plate (option).

2) According to the number of air outlets and height of the ceiling to install the unit, be sure to set the up switches (SW8-3, SW8-4) on the indoor board to the appropriate setting.
• Correspondence of ceiling heights to numbers of air outlets.



SW8

Ceiling height & discharge direction

(Unit : feet)

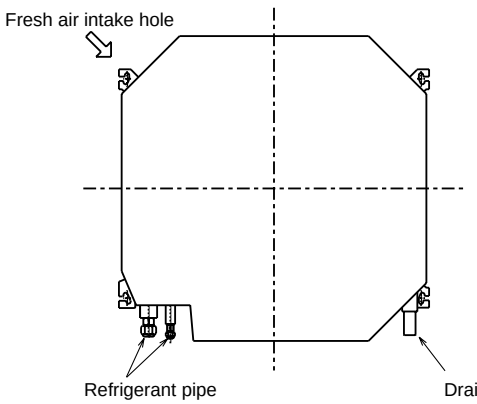
PLH18AK	SW8-1,2 / SW8-3,4	Standard SW8-1 OFF SW8-2 OFF	High ceiling ① SW8-1 ON SW8-2 OFF	High ceiling ② SW8-1 ON SW8-2 ON
4 direction	SW8-3 OFF SW8-4 OFF	8.9	9.8	11.5
3 direction	SW8-3 ON SW8-4 OFF	9.8	10.8	11.5
2 direction	SW8-3 ON SW8-4 ON	10.8	11.5	—

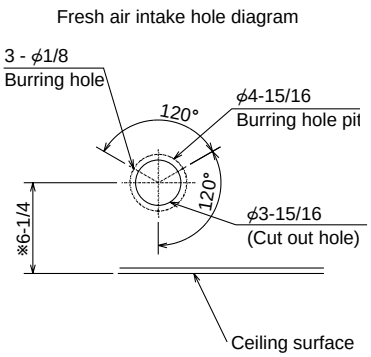
PLH24, 30, 36, 42AK	SW8-1,2 / SW8-3,4	Standard SW8-1 OFF SW8-2 OFF	High ceiling ① SW8-1 ON SW8-2 OFF	High ceiling ② SW8-1 ON SW8-2 ON
4 direction	SW8-3 OFF SW8-4 OFF	10.5	11.8	13.8
3 direction	SW8-3 ON SW8-4 OFF	11.8	13.1	13.8
2 direction	SW8-3 ON SW8-4 ON	13.1	13.8	—

2. Fresh air intake (Installation of site)

• At the time of installation, use the duct holes (cut out) located at the positions shown in following diagram, as and when required.

Note :
Be sure to add5-5/16inch to the dimensions in the diagram that are marked with a "※" if installing a multi function casement (Option)



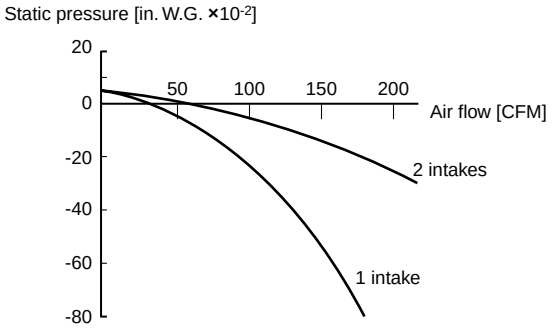


(Unit : inch)

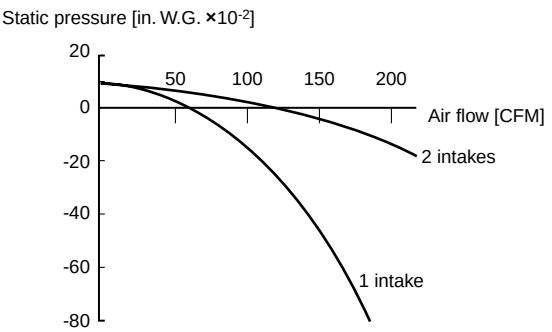
3. Fresh air intake amount & static pressure characteristics

① PLH18AK

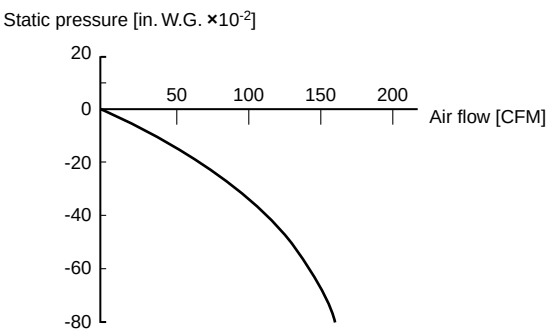
Multifunction casement + Standard filter



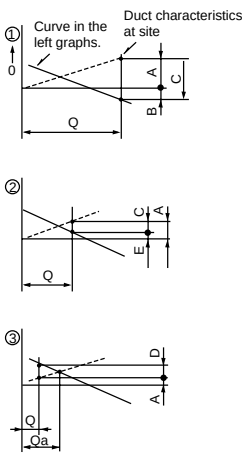
Multifunction casement + High efficiency filter



Taking air into the unit



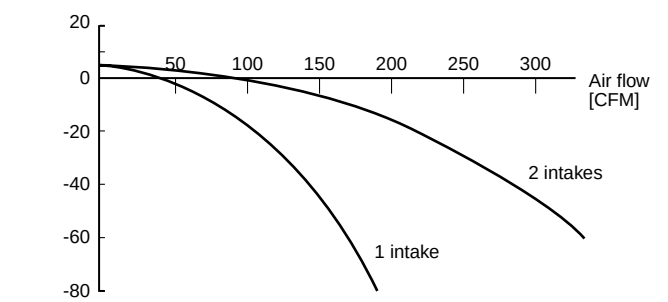
How to read curves



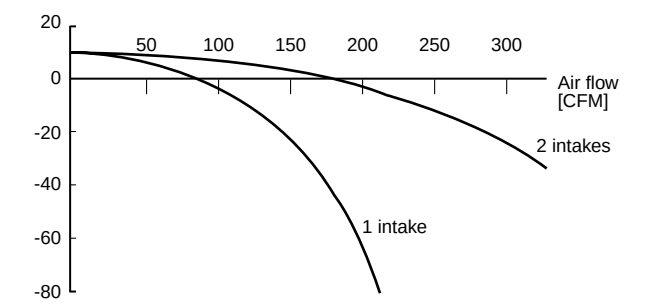
Q…Planned amount of fresh air intake <CFM>
A…Static pressure loss of fresh air intake duct system with air flow amount Q <in.W.G.×10-2>
B…Forced static pressure at air conditioner inlet with air flow amount Q <in.W.G.×10-2>
C…Static pressure of booster fan with air flow amount Q <in.W.G.×10-2>
D…Static pressure loss increase amount of fresh air intake duct system for air flow amount Q <in.W.G.×10-2>
E…Static pressure of indoor unit with air flow amount Q <in.W.G.×10-2>
Qa…Estimated amount of fresh air intake with out D <CFM>

② PLH24/30/36/42AK

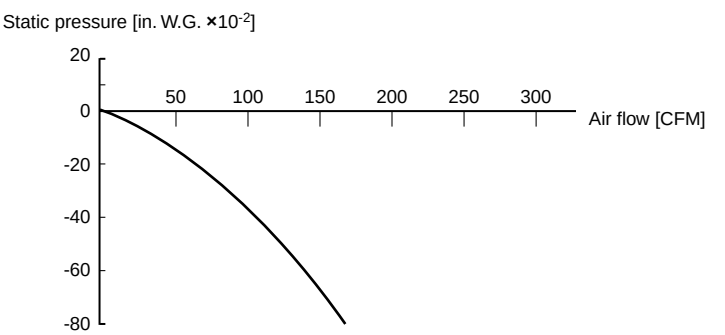
Multifunction casement + Standard filter



Multifunction casement + High efficiency filter



Taking air into the unit



4. Interlocking operation method with duct fan (Booster fan)

●Whenever the indoor unit is operating, the duct fun also operates.

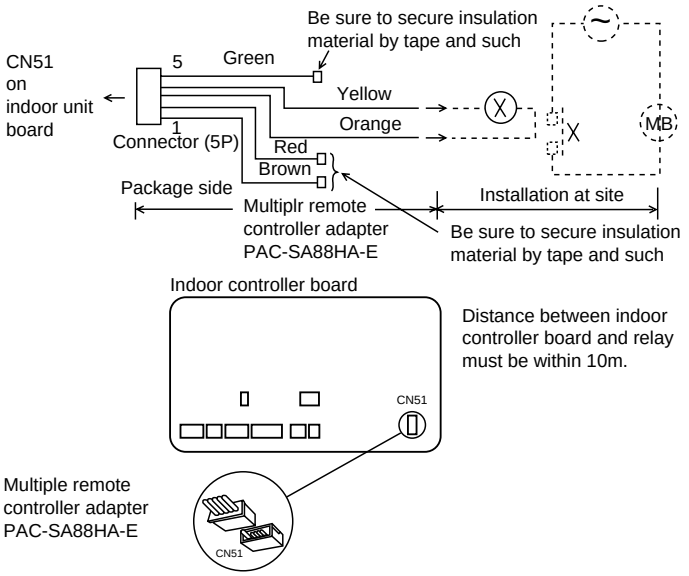
(1)Connect the optional multiple remote controller adapter(PAC-SA88HA-E)to the connector CN51 on the indoor controller board.

(2)Drive the relay after connecting the 12V DC relay between the Yellow and Orange connector lines.

Use a relay under 1W.

MB: Electromagnetic switch power relay for duct fan.

X: Auxiliary relay (12V DC LY-1F)



5. BRANCH DUCT(Installation at site)

Discharge by branch duct becomes possible by installing a branch duce at site. Knockout holes on the wall panel of the indoor unit must be removed.

Branch Duct Installation Procedure

At the time of installation, use the duct holes (cut out) located at the positions shown in following diagram, as and when required.

Note :

The figure marked with ※ in the drawing represent the dimensions of the main unit excluding those of the optional multi function casement.

When installing the optional multi function casement, add 5-5/16 inch to the dimensions marked on the figure.

When installing the branch ducts, be sure to insulate adequately. Otherwise condensation and dripping may occur.

Figure 1. Branch duct mounting position

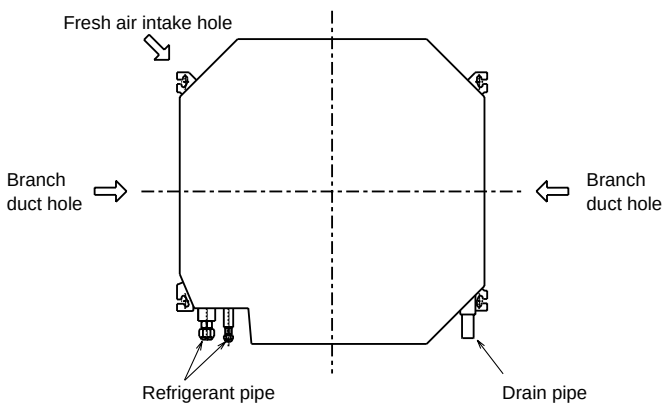
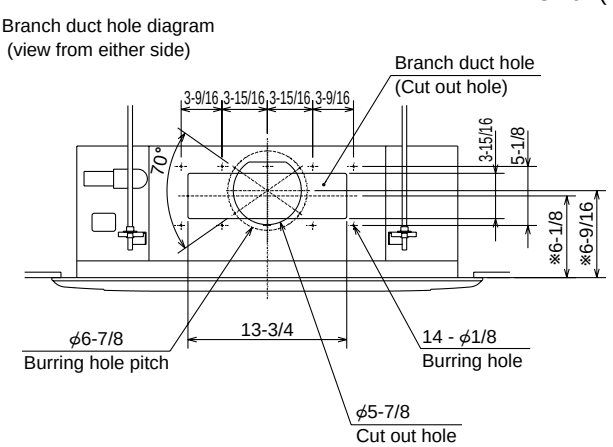


Figure 2. Branch duct connection details

Unit : (inch)

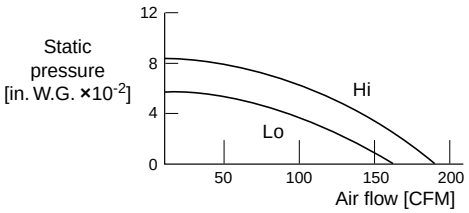


6. Air flow & Static pressure characteristics of Branch Duct (with SWA at “Standard”)

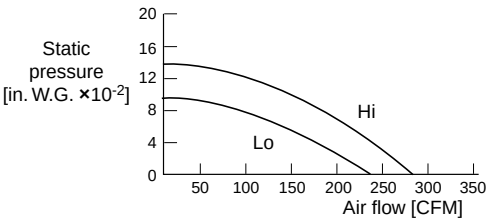
4 direction airflow (Horizontal vane)

Rectangular duct

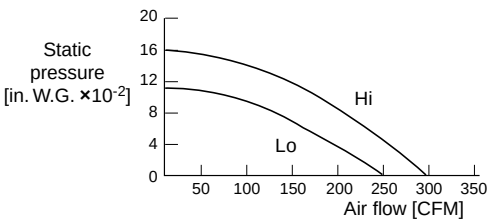
PLH18AK



PLH24AK

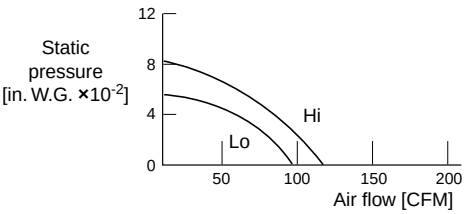


PLH30/36/42AK

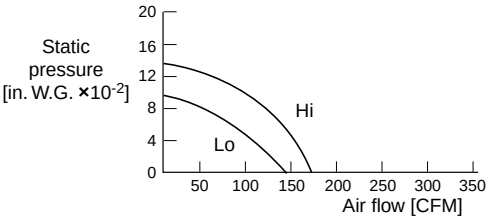


Rounded duct

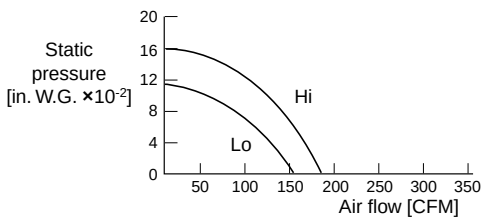
PLH18AK



PLH24AK



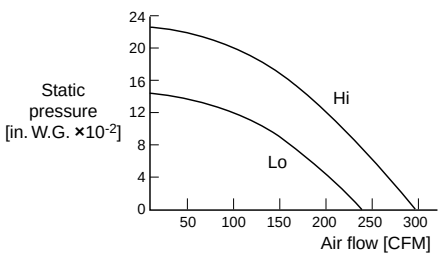
PLH30/36/42AK



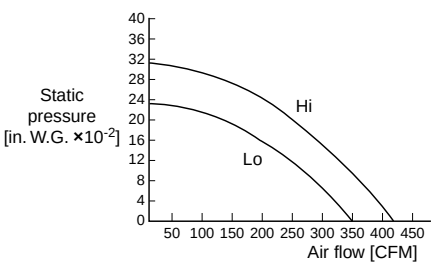
3 direction airflow (Horizontal vane)

Rectangular duct

PLH18AK

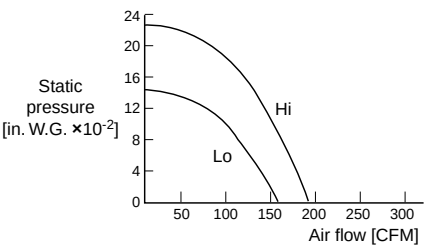


PLH24AK



Rounded duct

PLH18AK



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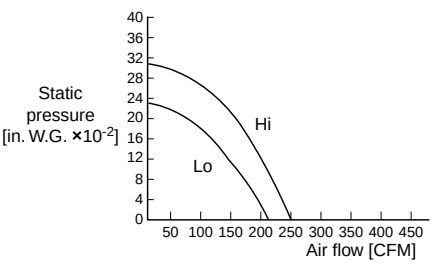
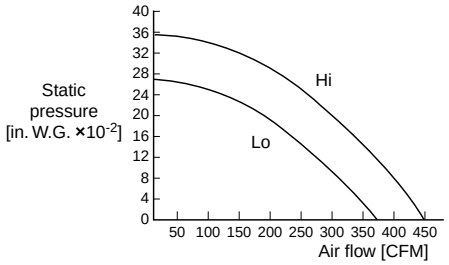


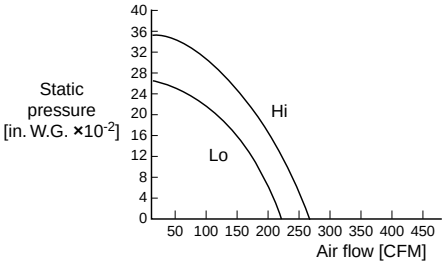
3 direction airflow (Horizontal vane)
Rectangular duct

PLH30/36/42AK



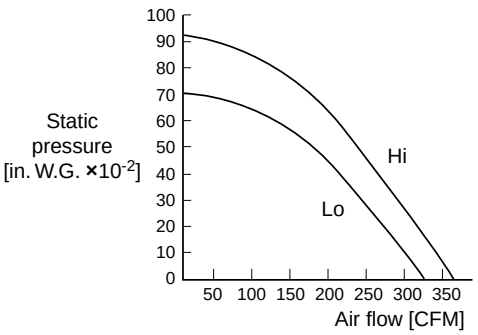
Rounded duct

PLH30/36/42AK



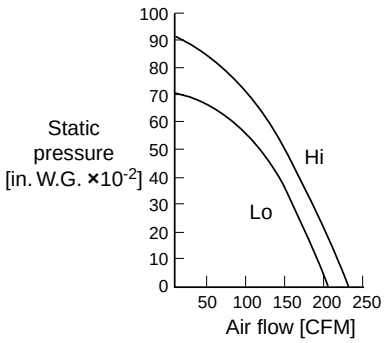
2 direction airflow (Horizontal vane)
Rectangular duct

PLH18AK



Rounded duct

PLH18AK



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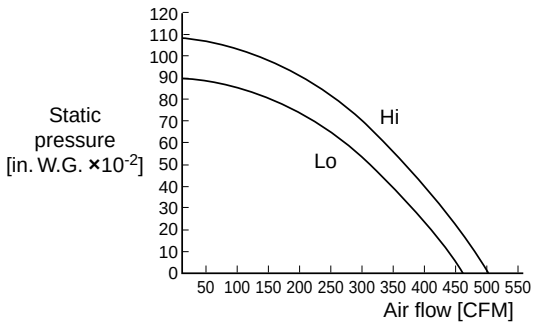

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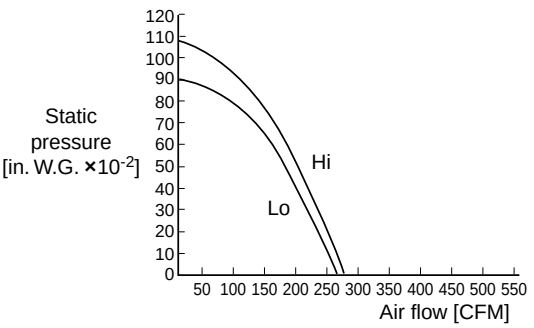
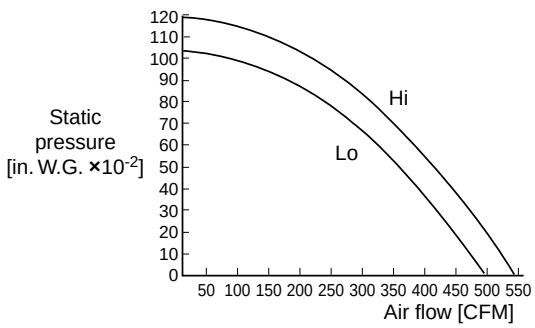
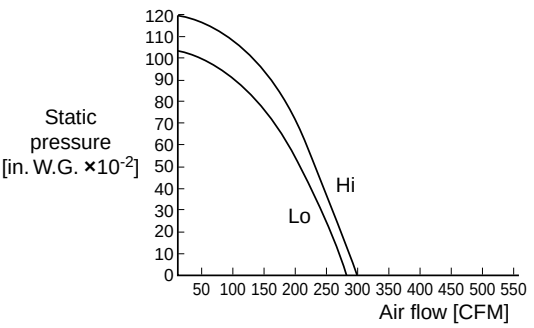


PLH30/36/42AK

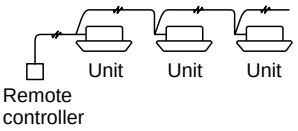
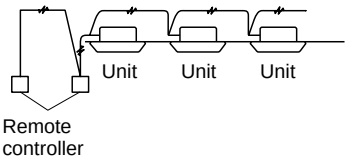
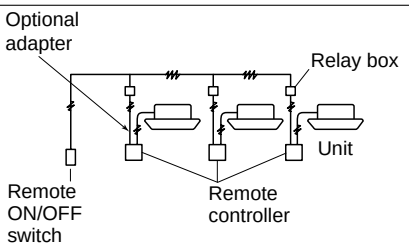
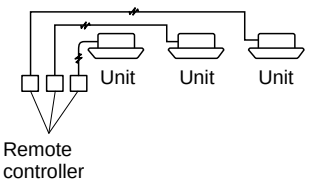
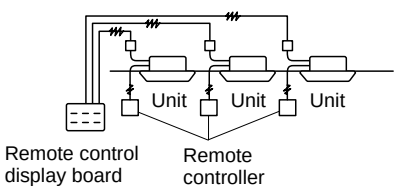
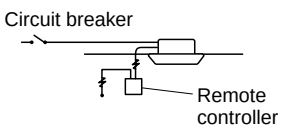


PLH30/36/42AK



12 SYSTEM CONTROL

1. VARIETY OF SYSTEM CONTROL FUNCTIONS

1 Group control with a single remote controller (See page OC244-55.)		Many units, installed at different locations, can be started and controlled with a single remote controller. The remote controller can be mounted in a different location using a non-polar two-wire cable, which can be extended up to 500m. A maximum of 50 units can be controlled with a single remote controller. All units operate in the same mode.
2 Control using two remote controllers (See page OC244-56.)		Two remote controllers can be used to control either one unit or a group of units. Units can then be controlled from a distance or at close range. Units operate according to the latest command from either remote controller.
3 Both remote ON/OFF and individual controls (See page OC244-56.) ※ Timer adapter (PAC-SA89TA-E) is needed.		All units can be turned on or off simultaneously using a remote ON-OFF switch. Also, each unit can be controlled individually by each remote controller. Dunning remote ON-OFF control, a message of “CENTRALLY CONTROLLED” is displayed on the LCD of the remote controller. This is available for both one unit control and several units control.
4 Individual control by grouping remote controllers (See page OC244-57.)		By grouping the remote controllers in one place, several units installed at different locations can be controlled individually, and operation conditions of all units are visible without a special control board. The control method is the same as that of the single unit with a single remote controller.
5 Multiple remote control display (See page OC244-58.) ※ Multiple display adapter (PAC-SA88HA-E) is needed.		Several units can be controlled with a remote control display board. Operation conditions of all the units are visible with the remote control display board. Individual control by each remote controller is also possible.
6 Auto restart function (See page OC244-58.)		A unit can be started or stopped with the circuit breaker on or off. Remote controller is also available. With this function, when the power is restored after power failure, the unit will restart automatically. (However, when the remote controller POWER ON/OFF button is OFF, the unit will not start.)

2. GROUP CONTROL WITH A SINGLE REMOTE CONTROLLER

A maximum of 50 units can be started in order according to the dip switch settings

2-1 How to wire

(1) Connect the remote controller to the double terminal block on the indoor controller board of the master unit (No.0 unit). (See Figure 1.)
(2) Connect the double terminal block of the master unit to the double terminal block of No.1 unit.
(3) Connect the double terminal block of No.1 unit to the double terminal block of No.2 unit.
(4) Continue the process until all the units are connected with two-wire cables. (See Figure 2.)
(5) Remove the connector CN40 from the indoor controller board of each unit except the master unit. (See Figure 3.)
(6) Set the unit-address of each unit with SW2 on the indoor controller board following the instructions below.

Figure 1

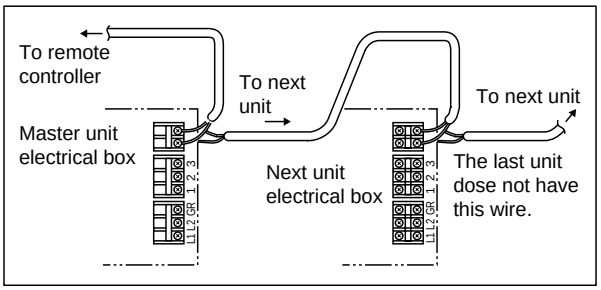
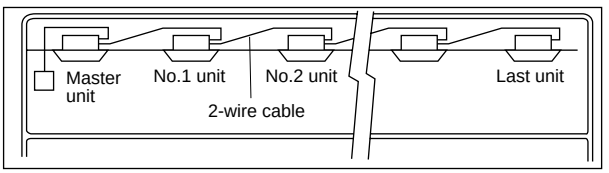

To remote controller
To next unit
To next unit
Master unit electrical box
Next unit electrical box
The last unit dose not have this wire.
L1 L2 OR 1 2 3

Figure 2



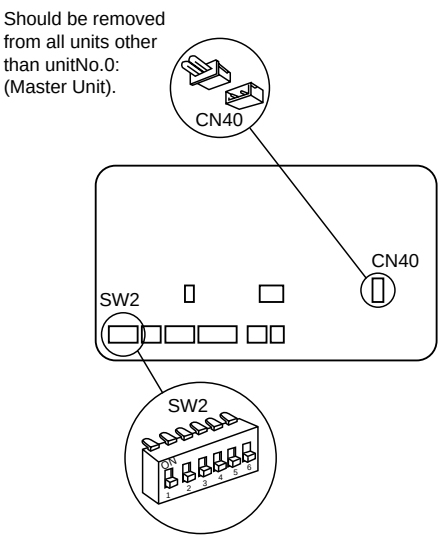
2-2 How to set unit-address

The unit-address also serves as a successive-start timer which starts each unit at intervals of 1 second. If two or more units have the same unit-address in a group control, operation stops due to system error. Be sure to set SW2 correctly following the instructions below.

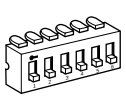
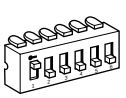
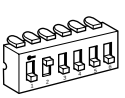
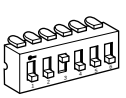
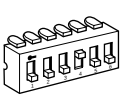
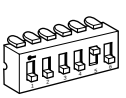
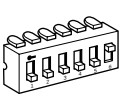
(1) Each lever of SW2 shows the number as follows.
SW2-1 : 1 SW2-4 : 8
SW2-2 : 2 SW2-5 : 16
SW2-3 : 4 SW2-6 : 32
(2) Total number of levers turned to ON shows the address of the unit.
For example, to set No.3 unit, turn ON SW2-1 and SW2-2.
(3) In this way, set from the master unit to the last unit.
Do not forget to set the master (No. 0) unit.

Figure 3

Indoor controller board ▼



Setting examples

	Master (No. 0) unit	No. 1 unit	No. 2 unit	No. 4 unit	No. 8 unit	No. 16 unit	No. 32 unit
SW2	ALL OFF 	1 ON 	2 ON 	3 ON 	4 ON 	5 ON 	6 ON 
Unit address & start delay in seconds.	0	1	2	4	8	16	32

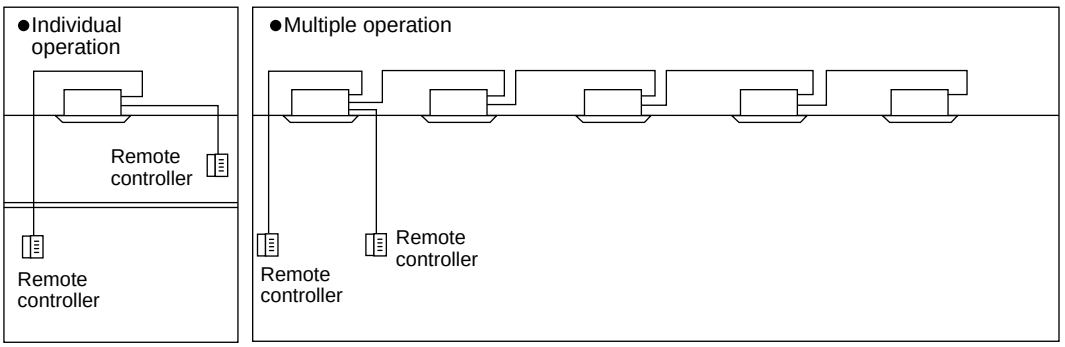
2-3 Unit control

The remote controller can control all units ON/OFF, temperature, air flow, and swing louver. However, the thermostat in each unit turns ON or OFF individually to adjust to the room temperature.

3. CONTROL USING TWO REMOTE CONTROLLERS

Two remote controllers can be used to control either one unit or a group of units. Units operate according to the latest command from either of the two remote controllers.
Before operation, be sure to set one remote controller as the “main controller” and the other as the “sub controller”, using dip switch SW17-7 of the remote controller.

Figure 4



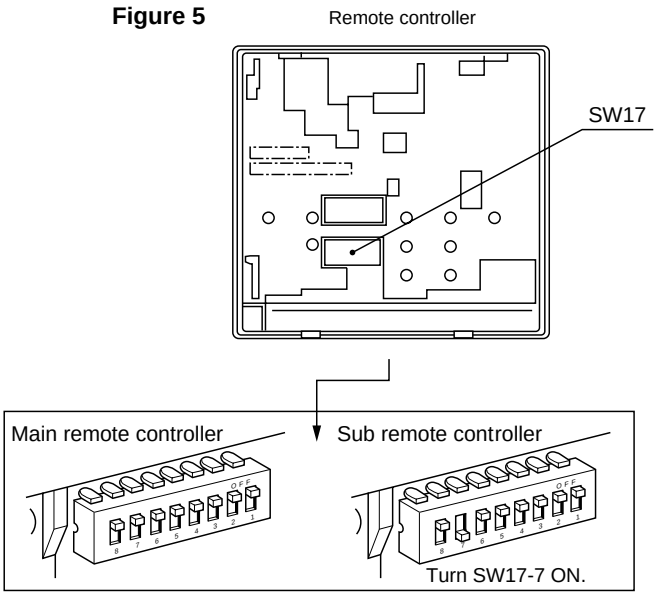
3-1 How to set SW17-7 (See Figure 5.)

(1) For the main remote controller, turn SW17-7 OFF.
(2) For the sub remote controller, turn SW17-7 ON.

3-2 Remote controller LCD indication

(1) The same indications always appear on both the main and sub remote controllers, except during the timer operations.
(2) Timer operations can be set with either of the two remote controllers. However, LCD indication appears only on the remote controller used for timer-settings.
(3)If both remote controllers are set for timer operation with different time-settings, the timer operation with the shorter remaining-time is effective.
(4) Self-diagnostic function is available with either of the two remote controllers. If one of the remote controllers is used for the self-diagnostic function, the other remote controller displays the check mode.
If the self-diagnostic function is reset by either of the two remote controllers, both remote controllers are reset.

Figure 5



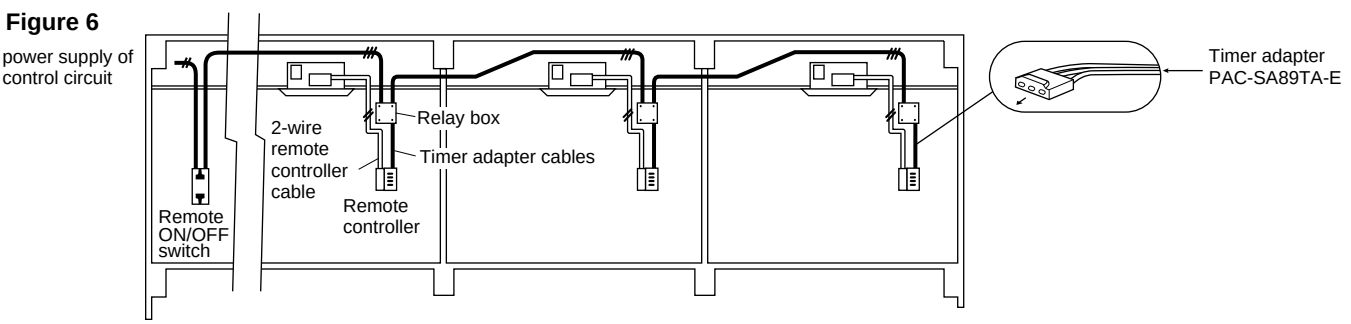
4. REMOTE ON-OFF AND INDIVIDUAL REMOTE CONTROLS

This method is available to control one unit or any number of units.
The following operations are available by connecting a relay, a timer adapter (PAC-SA89TA-E), and a remote ON/OFF switch to the system. Timer adapter is an optional part. Other parts are available on the market.
(A) To start all units in order by remote ON-OFF switch
(B) To stop all units simultaneously by remote ON-OFF switch
(C) To switch between the remote ON-OFF control and the individual remote control

4-1 System

Figure 6 shows the case of three units. The same is the case with any number of units.

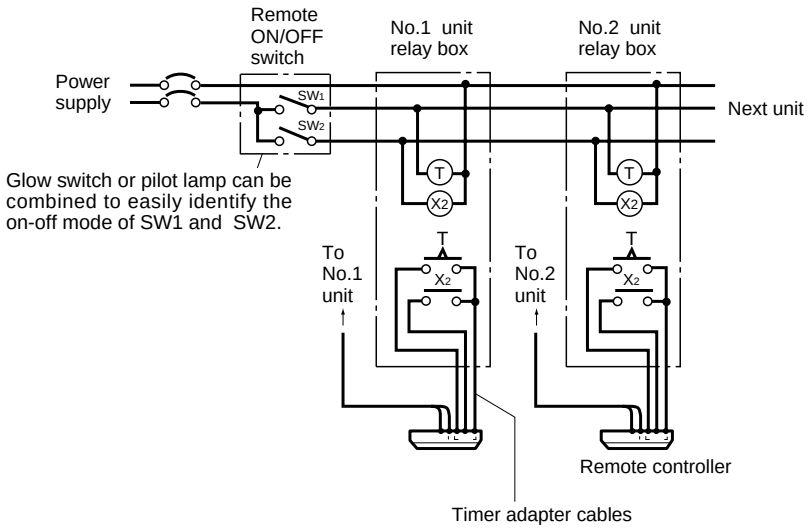
Figure 6



NOTE1 : Install the relay box where you can be serviced it easily.
NOTE2 : For control circuit wiring, use a wire of No. 14 AWG or a control cable according to the power supply of control circuit.
NOTE3 : When the power supply of the control circuit is 208/230V AC,
- Do not connect the control circuit wire to the remote controller cable directly.
- Do not place the control circuit wire and the remote controller cable into the same conduit tube.

4-2 Basic wiring

Caution : Before starting all units simultaneously by the remote ON-OFF switch, be sure to connect a sequence-start timer into the remote ON-OFF circuit. Otherwise, a rush of starting current may damage the power supply.



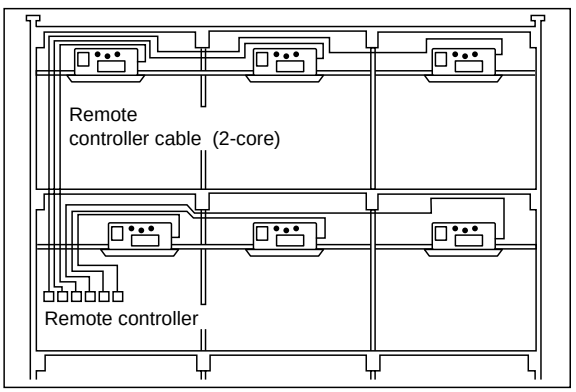
4-3 Switch function of remote ON-OFF switch

		SW2 (Switches between remote ON-OFF and individual control)	
		ON (Remote ON-OFF control)	OFF (Individual control)
SW1 (Switches between remote ON and OFF.)	ON (Start)	All units start together. ※1 Individual control is not available.	Each unit can be controlled by each remote controller. Remote ON-OFF switch is not available.
	OFF (Stop)	All units stop together. ※2 Individual control is not available.	

※1After all units start together, if SW2 is turned OFF, each unit can be individually stopped by each remote controller.
※2After all units stop together, if SW2 is turned OFF, each unit can be individually started by each remote controller.

5. INDIVIDUAL CONTROL BY GROUPING THE REMOTE CONTROLLERS

- Grouping the remote controllers allows individual control and centralize monitoring of units installed in different places without a special control board.
- Remote control cables are extendible up to 550 yards When the cable length exceeds 33ft, use the double-insulated two-care cable such as Belden 9407. Also, the cable thickness must be No. 22 AWG or above.
- When gathering the power ON/OFF switches of air conditioners near the remote controllers, you should also install the power ON/OFF switch near each unit to prevent electric trouble during servicing.



6. MULTIPLE REMOTE CONTROL DISPLAY

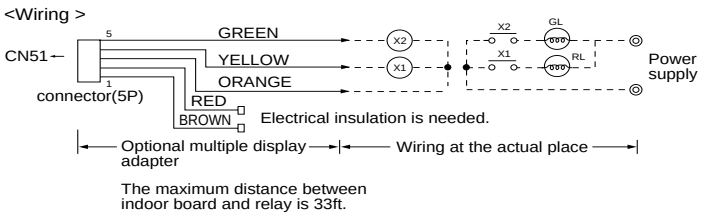
You can control several units with a multiple remote control display, by wiring an optional multiple display adapter (PAC-SA88HA-E) with relays and lamps on the market.

How to wire

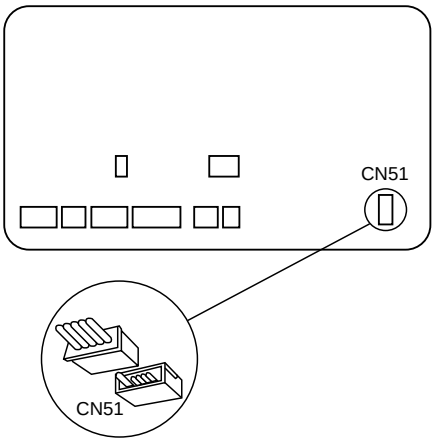
(1) Connect the multiple display adapter to the connector CN51 on the indoor controller board.

(2) Wire three of the five wires from the multiple display adapter as shown in the figure below.

<Wiring >

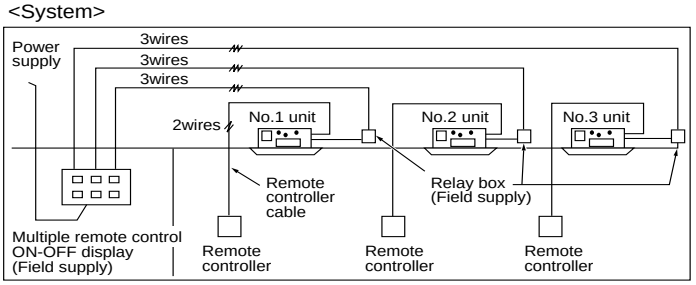


Indoor controller board



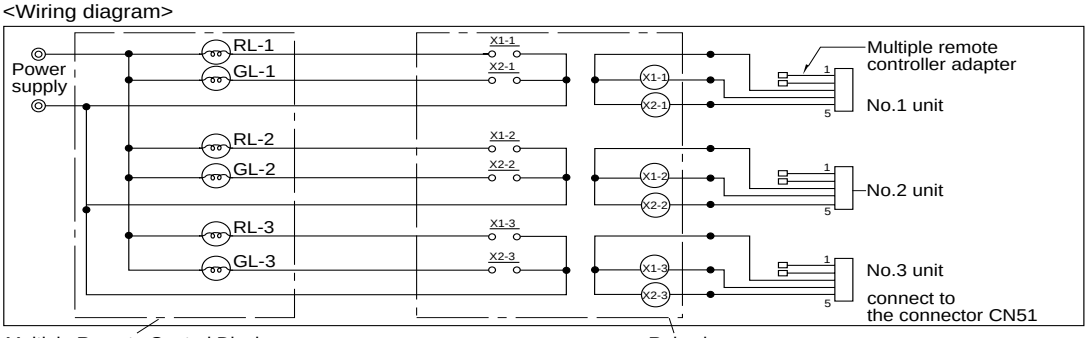
[Notes on Signs]
X1:Relay (for operation lamp)
X2:Relay (for check lamp)
RL:Operation Lamp
GL:Check Lamp
[Field supplied parts]
Relays:12V DC with rated coil power consumption below 0.9W.
Lamps:Matching to power supply voltage.

<System>



(Operation check)

<Wiring diagram>



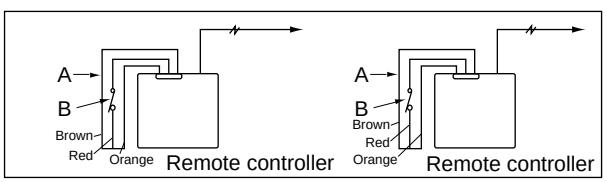
7. AUTO RESTART FUNCTION

By setting the dip switch SW1-8 to ON, the air conditioner can be started/stopped by power supply ON/OFF.
If the air conditioner is OFF before the power failure, it will not start operation by power restore.

•This function is mainly to emergency performance when the power supply stops temporarily. Therefore, since the protection function (for example, clank case heater and prevention from restarting in 3 minutes, etc.) of the device is not operated, this function should not be used mostly.

8. TIMER OPERATION OR THE OPERATION BY AN EXTERNAL SIGNAL

<Wiring>



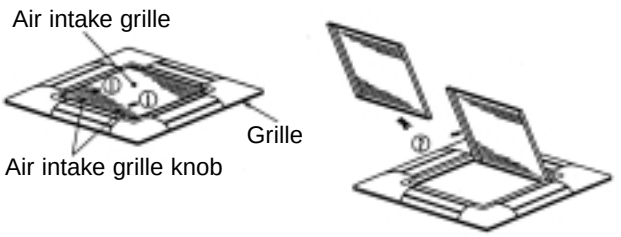
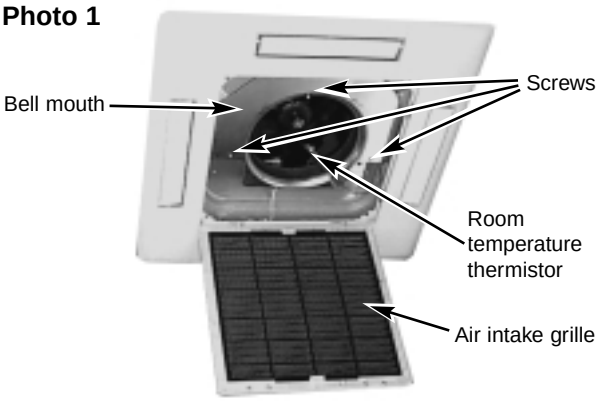
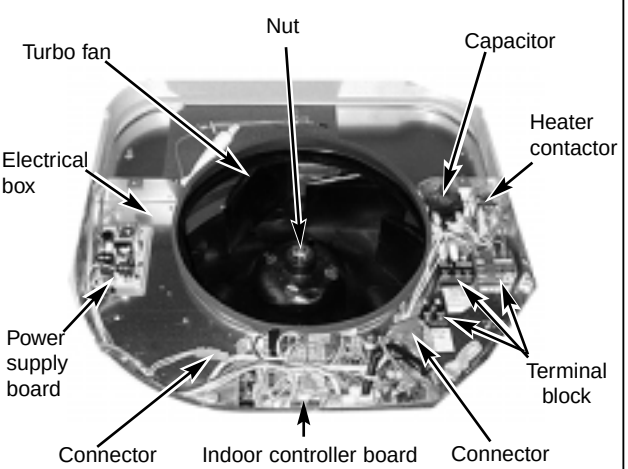
A : an optional timer adapter
B : a single-throw switch

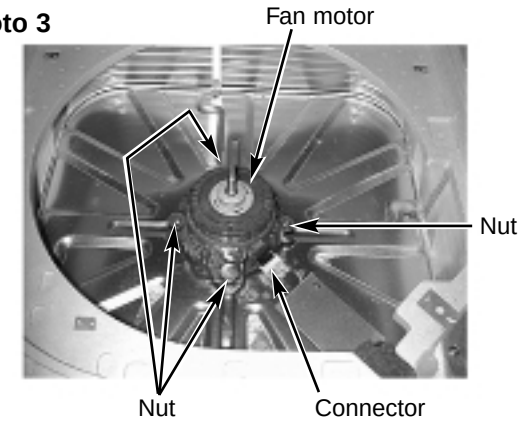
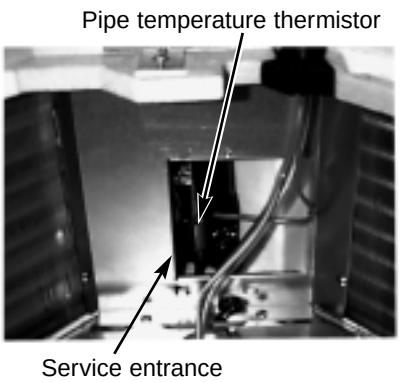
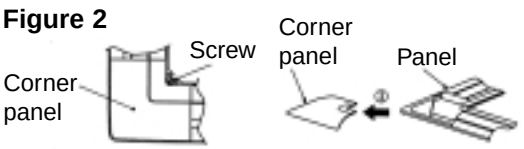
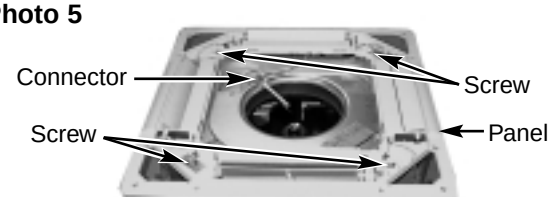
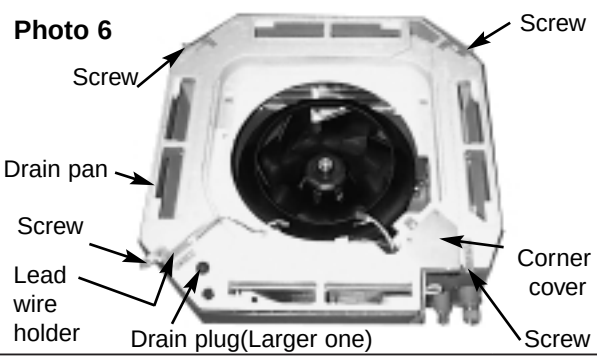
For remote control, connect the optional timer adapter (PAC-SA89TA-E)

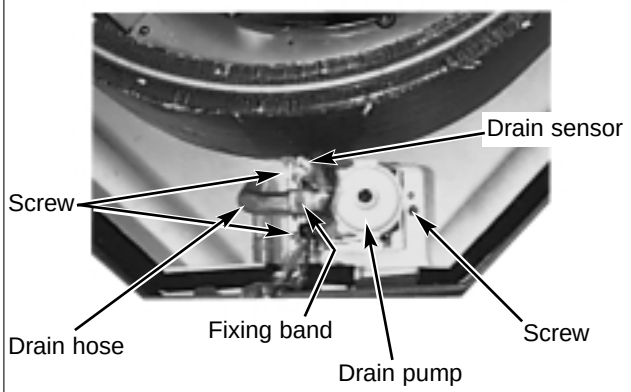
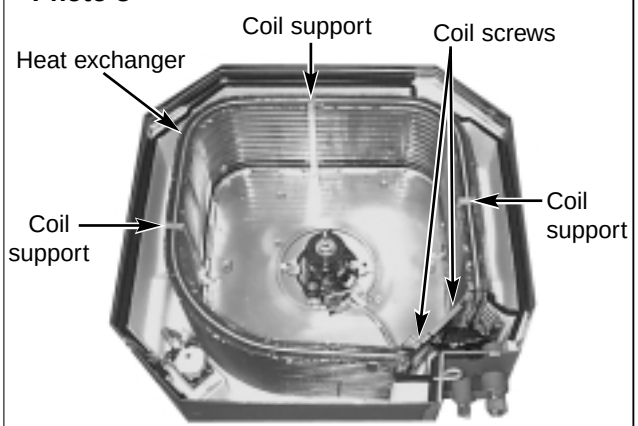
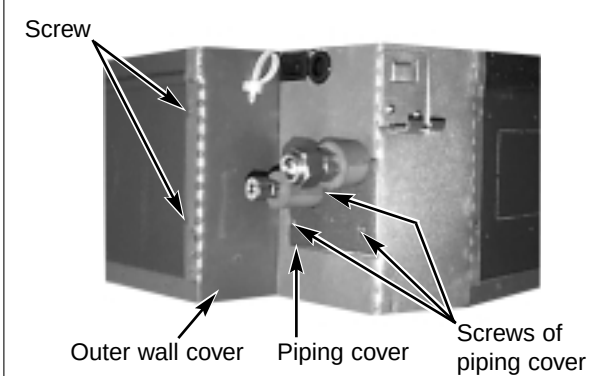
13 DISASSEMBLY PROCEDURE

PLH18AK

Be careful on removing heavy parts.

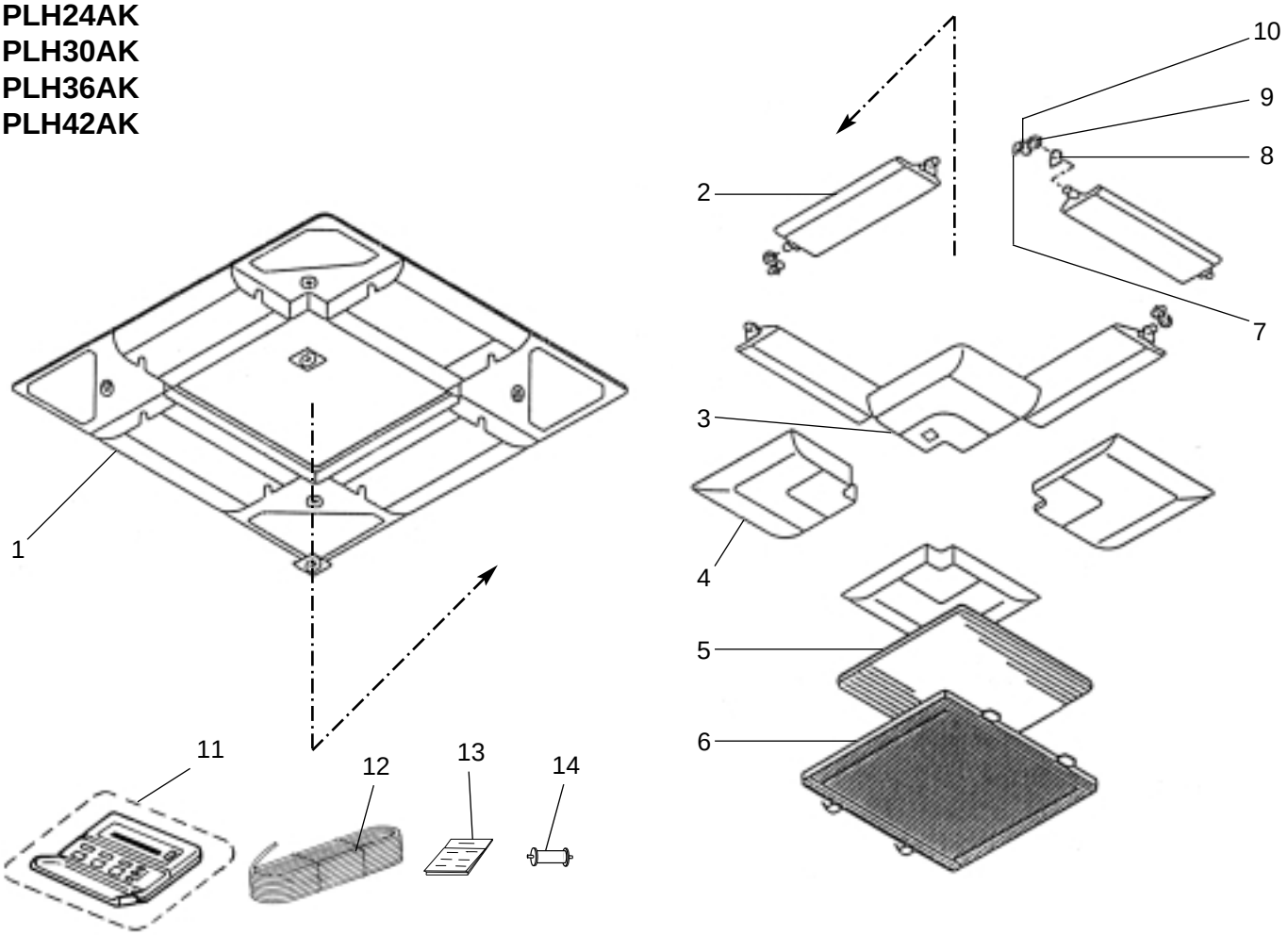
OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
1. Removing the air intake grille (1) Slide the knob of air intake grille to the direction of the arrow ① to open the air intake grille. (2) Remove the string hook from the panel to pretend the grille from dropping. (3) Slide the shaft in the hinge to the direction of the arrow② and remove the air intake grille.	**Figure 1** 
2. Removing the room temperature thermistor (1) Remove the screw(×1) in the room temperature thermistor holder to remove the holder and the room temperature thermistor. (2) Remove the 1 screw from the bell mouth, and unscrew the another 2 screws (fixed to the oval hole which has different diameter) to remove the bell mouth. (3) Hold the holder claw, and remove the room temperature thermistor and holder. (4) Disconnect the connector (red) in the indoor control board.	**Photo 1** 
3. Removing the electrical box (1) Disconnect the lead wire of the vane motor from the clamp, and disconnect the white connector (10P). (2) Remove the room temperature thermistor with the holder. (3) Remove the bell mouth.(See photo 1) (4) Disconnect the relay connector in the electrical box. Red (3P) for fan motor White (2P) for pipe temperature detecting thermistor Blue (2P) for drain pump White (3P) for drain sensor Green (6P) for auxiliary heater (5) Remove the 3 screws from the electrical box, loosen another 2 screws to remove the box. <Electrical parts in the electrical box> Indoor controller board Power supply board Terminal block Capacitor Heater contactor	**Photo 2** 

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
4. Remove the fan motor (1) Remove the bell mouth.(See photo 1) (2) Remove the electrical box.(See photo 2) (3) Remove the turbo fan nut. (4) Pull out the turbo fan. (5) Disconnect the connector of the fan motor lead wire. (6) Remove the 4 nuts of the fan motor.	**Photo 3** 
5. Removing the pipe temperature thermistor (1) Remove the bell mouth.(See photo 1) (2) Remove the electrical box.(See photo 2) (3) Remove the turbo fan. (4) Remove the screw of the service panel. (5) Remove the service panel. (6) Remove the pipe temperature thermistor which is inserted into the holder installed to the thin copper pipe. (7) Disconnect the 2-pin white connector.	**Photo 4** 
6. Removing the panel (1) Remove the air intake grille.(See figure 1) **Corner panel (See figure 2)** (1) Remove the screw of the corner. (2) Slide the corner panel to the direction of the arrow③, and remove the corner panel. **Panel (See photo 5)** (1) Disconnect the connector that connects with the unit. (2) Remove the 2 screws from the panel and loose another 2 screws, which fixed to the oval hole, have different diameter. (3) Rotate the panel a little to remove the screws.(Slide the panel so that the screw comes to a large diameter of the oval hole, which has two different diameters.)	**Figure 2**  **Photo 5** 
7. Removing the drain pan (1) Remove the panel. (See photo 5) (2) Remove the drain plug (Larger one), drain the remaining water in the drain pan. (3) Remove the corner cover. (2 screws) (4) Remove the bell mouth (See photo 1) (5) Remove the electrical box. (See photo 2) (6) Remove the lead wire holder. (1 screw) (7) Remove the 4 screws and pull out the drain pan. ※ Pull out the left and right of the pan gradually. Be careful not to crack or damage the pan.	**Photo 6** 

OPERATING PROCEDURE	PHOTOS&ILLUSTRATIONS
8. Removing the drain pump and drain sensor (1) Remove the panel. (See photo 5) (2) Remove the bell mouth. (See photo 1) (3) Remove the electrical box. (See photo 2) (4) Remove the drain pan. (See photo 6) (5) Remove the 3 screws of the drain pump. (6) Cut the drain hose band, pull out the drain hose from the drain pump. (7) Pull out the drain pump. (8) Remove the drain sensor and the holder.	**Photo 7** 
9. Removing the heat exchanger (1) Remove the panel. (See photo 5) (2) Remove the bell mouth. (See photo 1) (3) Remove the electrical box. (See photo 2) (4) Remove the drain pan. (See photo 6) (5) Remove the turbo fan. (See photo 3) (6) Remove the 3 screws of the piping cover, and pull out piping cover. (7) Remove the 4 screws of the outer wall cover, and pull out the outer wall cover. (8) Remove the screw of the coil support. (9) Remove the 2 screws of the coil. (10) Pull out the heat exchanger.	**Photo 8**  **Photo 9** 

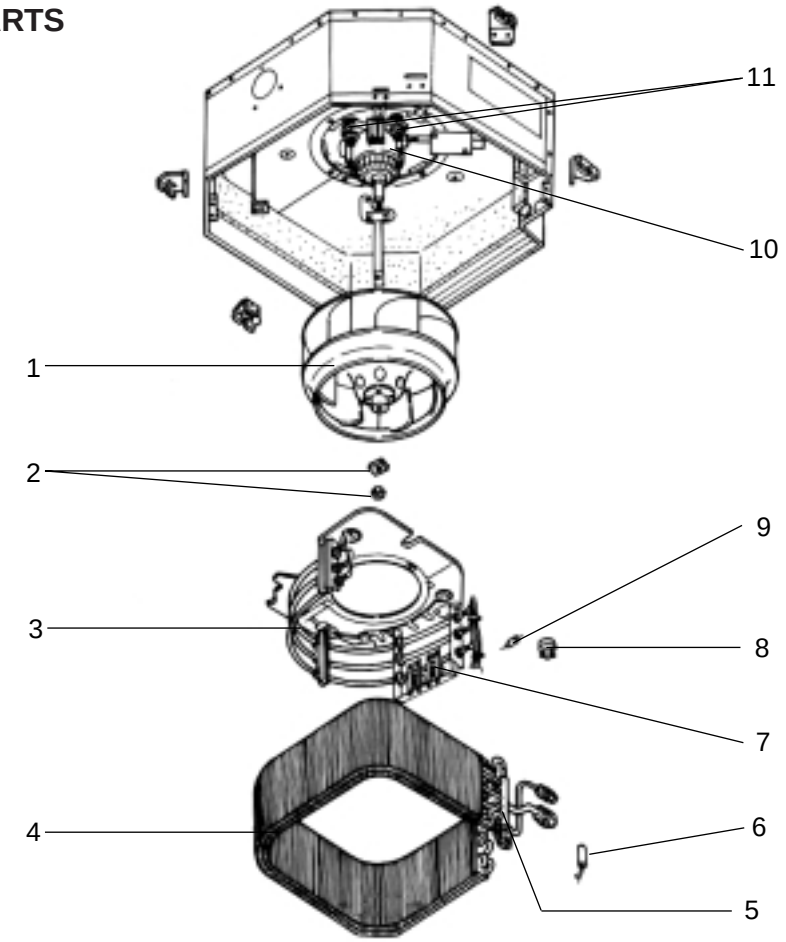
14 PARTS LIST

PANEL PARTS
PLH18AK
PLH24AK
PLH30AK
PLH36AK
PLH42AK



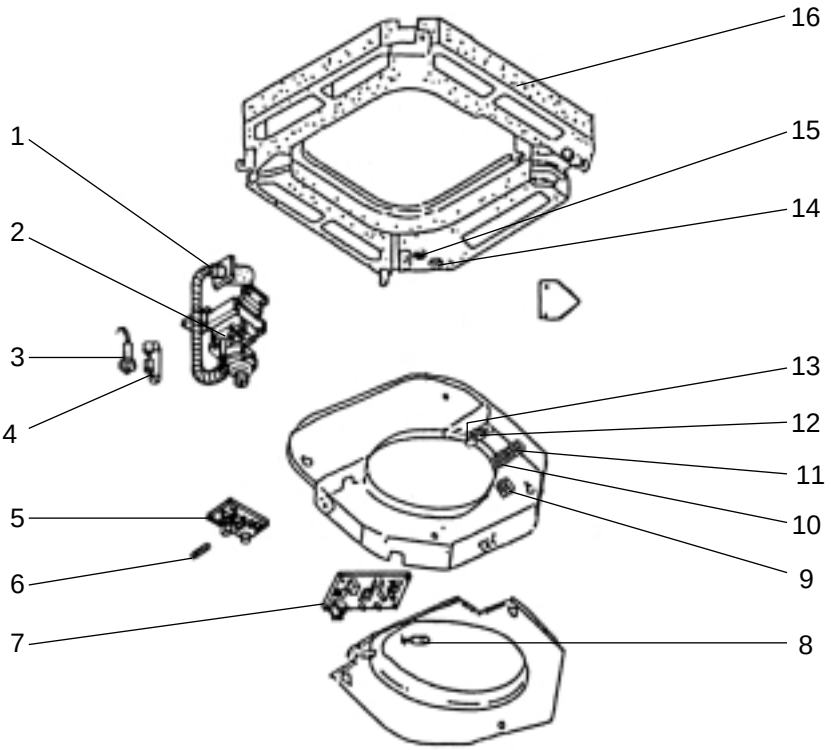
No.	Parts No.	Parts Name	Specification	Q'ty / set	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PLH 18 , 24 , 30 , 36 , 42 AK				Unit	Amount
1	T7W E12 003	AIR OUTLET GRILLE		1					
2	T7W E05 002	VANE ASSY		4					
3	R01 E01 638	CORNER PANEL		1					
4	R01 E00 638	CORNER PANEL		3					
5	R01 E00 500	L.L FILTER		1					
6	R01 E00 691	GRILLE ASSY		1					
7	R01 E00 223	VANE MOTOR		4		MV			
8	R01 E00 063	VANE BUSH		8					
9	R01 E00 040	GEAR (VANE)		4					
10	R01 E01 040	GEAR		4					
11	T7W E05 713	REMOTE CONTROLLER BOARD		1		R.B			
12	T7W A00 305	CABLE ASSY	35ft	1					
13	T7W E00 673	SCREW ASSY		1					
14	T7W E01 239	FUSE	250V 0.16A	1		F3			

FUNCTIONAL PARTS
PLH18AK
PLH24AK
PLH30AK
PLH36AK
PLH42AK



No.	Parts No.	Parts Name	Specification	Q'ty / set					Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price	
				PLH								Unit	Amount
				18 AK	24 AK	30 AK	36 AK	42 AK					
1	R01 E00 114	TURBO FAN		1									
	R01 E01 114	TURBO FAN			1	1	1	1					
2	R01 08K 097	SPL WASHER		1	1	1	1	1					
3	T7W E07 300	HEATER ELEMENT	700W	3	3					H1			
	T7W E06 300	HEATER ELEMENT	867W			3				H1			
	T7W E05 300	HEATER ELEMENT	1000W				3	3		H1			
4	T7W E71 480	HEAT EXCHANGER		1									
	T7W E72 480	HEAT EXCHANGER			1								
	T7W E73 480	HEAT EXCHANGER				1							
	T7W E74 480	HEAT EXCHANGER					1						
	T7W E75 480	HEAT EXCHANGER						1					
5	R01 E00 418	RESTRICTOR VALVE		1	1	1	1	1					
6	T7W E06 202	PIPE TEMPERATURE THERMISTOR		1	1	1	1	1		RT2			
7	R01 20J 303	INSULATOR		1	1	1	1	1					
8	T7W E00 700	THERMOSTAT		1	1	1	1	1		26H			
9	T7W E02 706	THERMAL FUSE	219°F	1	1	1	1	1		FS2			
10	T7W E12 762	FAN MOTOR	PN6N70-L	1						MF			
	T7W E13 762	FAN MOTOR	PN6N120-L				1	1		MF			
	T7W E08 762	FAN MOTOR	PN6N110-L		1	1				MF			
11	R01 A41 105	RUBBER MOUNT		4	4	4	4	4					

FUNCTIONAL PARTS
PLH18AK
PLH24AK
PLH30AK
PLH36AK
PLH42AK



No.	Parts No.	Parts Name	Specification	Q'ty / set PLH 18 AK	24 AK	30 AK	36 AK	42 AK	Remarks (Drawing No.)	Wiring Diagram Symbol	Recommended Q'ty	Price Unit	Amount
1	T7W E00 527	DRAIN HOSE		1	1	1	1	1					
2	T7W E03 355	DRAIN PUMP		1	1	1	1	1		DP			
3	R01 E00 266	DRAIN SENSOR		1	1	1	1	1		DS			
4	R01 31K 241	SENSOR HOLDER		1	1	1	1	1					
5	R01 E02 313	POWER BOARD		1	1	1	1	1		P.B			
6	T7W 410 239	FUSE	250V 6A	2	2	2	2	2		F1,F2			
7	T7W E14 310	CONTROLLER BOARD		1	1	1	1	1		I.B			
8	R01 E00 202	ROOM TEMPERATURE THERMISTOR		1	1	1	1	1		RT1			
9	R01 KV6 246	TERMINAL BLOCK	2P (1, 2)	1	1	1	1	1		TB5			
10	R01 556 246	TERMINAL BLOCK	3P (1, 2, 3)	1	1	1	1	1		TB4			
11	T7W E11 716	TERMINAL BLOCK	3P (L1, L2, GR)	1	1	1	1	1		TB2			
12	R01 673 215	HEATER CONTACTOR	LY-2F DC12V	1	1					88H1			
	R01 479 215	HEATER CONTACTOR	LY-1F DC12V			2	2	2		88H1,88H2			
13	T7W E06 255	CAPACITOR	3.5μF 440V	1						C			
	T7W E02 255	CAPACITOR	7.0μF 440V		1	1	1	1		C			
14	R01 A41 524	DRAIN PLUG		1	1	1	1	1					
15	R01 A48 524	DRAIN PLUG		1	1	1	1	1					
16	T7W E06 529	DRAIN PAN		1									
	T7W E07 529	DRAIN PAN			1	1							
	T7W E08 529	DRAIN PAN					1	1					

15 OPTIONAL PARTS

1. REFRIGERANT PIPES

Service Ref. : PLH18AK/24AK

Part No.		PACSK03FS	PACSK05FS	PACSK07FS	PACSK10FS	PACSK15FS
Pipe length	(ft.)	10	16	23	33	49
Pipe size O.D.(in.)	(in.)	Liquid:ϕ3/8 Gas:ϕ5/8				
Connection method		Indoor unit: Flared Outdoor unit: Flared				

Service Ref. : PLH30/36AK

Part No.		PACSK03FF	PACSK05FF	PACSK07FF	PACSK10FF	PACSK15FF
Pipe length	(ft.)	10	16	23	33	49
Pipe size O.D.(in.)	(in.)	Liquid:ϕ1/2 Gas:ϕ3/4				
Connection method		Indoor unit: Flared Outdoor unit: Flared				

Service Ref. : PLH42AK

Part No.		PACSK07FK	PACSK15FK
Pipe length	(ft.)	23	49
Pipe size O.D.(in.)	(in.)	Liquid:ϕ1/2 Gas:ϕ7/8	
Connection method		Indoor unit: Flared Outdoor unit: Flared	

Note 1. The refrigerant pipes and the indoor unit contain a nitrogen holding charge which must be removed by evacuation.
<Piping connection procedures>
See that ball valve on outdoor unit is fully shut (unit is shipped with valve shut). Remove caps from piping and unit and make flare connection promptly. Repeat for each connection, one at a time.
After all piping connections between indoor and outdoor unit have been completed, vacuum-purge air from system through the service port for the ball valve on the outdoor unit.

Note 2. The following parts are contained in optional refrigerant piping kit.
Heat insulating cover, vinyl tapes, nipples, sleeve and flange (for wall hole), connecting cables etc.

2. TIMER

When using a program timer, a program timer adapter (PAC-825AD) is also needed.

Part No.	PAC-SC32PTA (with set back function)
Model Name	Program timer

2-1 Program timer specifications

Parts name	Program timer
Parts No.	PAC-SC32PTA
Exterior dimensions (inch)	5-4/32x4-23/32x23/32 (130x120x18mm)
Installation	Wall mount
Type of clock	Quartz
Clock accuracy	±50 second / month at 77°F
Display-Time -Week -Timer setting unit	Liquid crystal display Liquid crystal display Liquid crystal display
Program cycle	24 hours
Timer setting unit	30 minutes
No. of set points	48 / day
Power rating	5V DC ±5% (Supplied by Remote Controller)

2-2 Feature of program timer

(1) Daily timer function

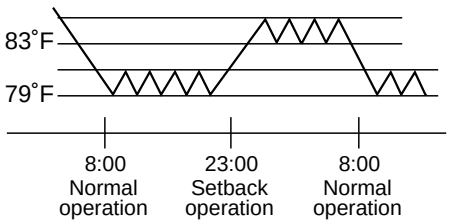
Daily timer can be set in 30 minutes units for up to 24 hours.
Each unit can be set for unit ON, unit OFF, or setback operation.

(2) Setback operation (PAC-SC32PT)

Set back operation is useful for reducing running costs
e.g. At a hotel with a 24-hour system
8:00~23:00 Cooling operation with set temperature at 79°F
23:00~8:00 Setback operation with 4 degrees of setback
As shown in the chart on the right, the set temperature rises 4 degrees automatically during the setback operation. When the setback operation ends, normal operation will begin.

(3) Weekly timer function

Daily timer function can apply to each day of the week.



2-3. Names and functions

<PAC-SC32PTA>

WEEKLY TIMER SETTING DISPLAY

Set timer for a week.

CURRENT TIME DISPLAY

During MONITOR status,current time is display.
During Daily timer setting, a time desire for timer setting is displayed.

SET BACK DISPLAY

Indicates the set back range.

DAILY TIMER SETTING DISPLAY

24 hours is divided into 48 blocks and each block express 30 minutes.
The block display consists of 3 pattern.

Set back
1=2°F 2=4°F 3=6°F 4=8°F.

SET BACK SETTING SW

Used for set back setting.

SET/MONITOR DISPLAY

During SET is display, clock adjustment, change of weekly day, daily and weekly timer setting can be performed.
During MONITOR is display, all switches except SET/MONITOR SW are invalidated.
This is normal status.

ON/SET BACK/OFF SW

Used to specify the time setting pattern.

WEEK DAY SETTING SW

Used for week day setting.

DAILY TIMER SW

Used for timer setting in 30 minutes unit.

MODE SELECTOR SW

Using this switch select “MONITOR” or “SET” Mode.

“MONITOR” :Indicates the current timer setting. All switch expect MODE SELECTOR SW are invalidated then.This is the normal status.

“SET”: Set to “SET” mode for clock adjustment, charge of week day, daily and weekly timer setting.

CLOCK ADJUSTMENT SW

Used for adjustment of the current time.

Push ⊙ SW to advance the time. Each time the button is pushed the time advance by 1 minute, pushing continuously advances by 1 minute at 0.5 second interval, and when the lower digit of minute becomes 0 indication advances in 10 minutes unit.

⊙ SW is used for reversing the time. Each time the button is pushed the time reverses by 1 minute, pushing continuously reverses the time by 1 minute at 0.5 second interval, and when the lower digit of minute becomes 0 indication reverses in 10 minutes unit.

WEEKLY TIMER SW

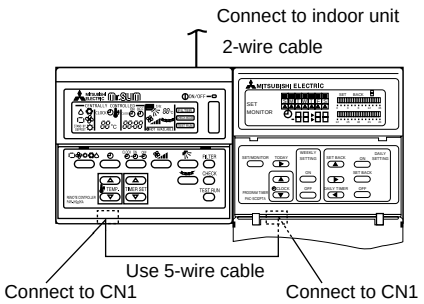
Used for setting timer in day of week unit.

Pushing ⊙ SW moves the week day light display in order of
S → M → T → W ···
enabling to set the week day.

2-4. How to connect program timer

(1) Install the program timer next to the remote controller the same way as the remote controller is installed.

(2) Connect the program timer and the remote controller with a 5-wire cable as shown in the figure below

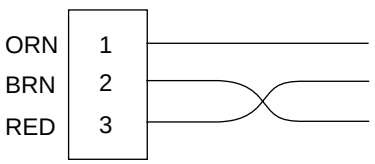


NOTE: While the program timer is connected to the remote controller, the 24hour ON/OFF timer on the remote controller will not operate.

3. TIMER ADAPTER

This adapter is needed for system control and for operation via external contacts. Adapter connection is described on page OC244-56.

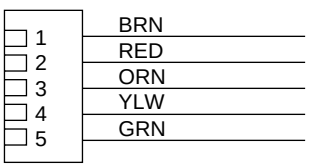
Part No.	PAC-SA89TA-E



4. MULTIPLE REMOTE CONTROLLER ADAPTER

This adapter is needed for remote indication (operation/check). Adapter connection is described on page OC244-58.

Part No.	PAC-SA88HA-E



5. MULTI FUNCTION CASEMENT (For HIGH EFFICIENCY FILTER AND FRESH AIR INTAKE)

Part No.	PAC-SG03TM-E
Applicable Model	PLH18/24/30/36/42AK

6. HIGH EFFICIENCY FILTER ELEMENT

Part No.	PAC-SG01KF
Applicable Model	PLH18/24/30/36/42AK

7. AIR OUTLET SHUTTER PLATE

Part No.	PAC-SG06SP-E
Applicable Model	PLH18/24/30/36/42AK

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